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Educational News and Editorial Comment

"A PRINCIPAL'S WORK BOOK"

Robert Hill Lane, assistant superintendent of schools, Los Angeles, California, has prepared a very useful document entitled, *A Principal's Work Book*. It consists of ninety-six mimeographed pages and gives a detailed list of the problems which confront the school principal and suggestions as to methods of meeting these problems.

One example of Mr. Lane's method of stating a problem and dealing with it will suffice to illustrate the character of the document.

2. What can I do to make the first day of school a success?
   a) Arrive as early as possible and make a rapid tour of inspection. See that each classroom has a card on the outside of the door with the grade and the teacher's name in large letters.
   b) See that a roster of teachers is posted in plain sight just inside each main entrance and in the principal's office.
   c) Divert to a senior teacher and a few pupil assistants as much of the routine of entrance of pupils, reception of parents, etc., as possible.
   d) Reserve own time until the first rush has abated for decisions on unclassified pupils, brief interviews with parents, and attention to emergency calls.
   e) Gather data as to enrolment by ten o'clock and make a preliminary

classification report. Study this and work out necessary readjustments for discussion at the afternoon teachers' meeting.

f) Visit each class before noon and say a word of greeting to pupils and teachers, noting especially condition of rooms under teachers new to the school.

g) Note passing of lines at noon to discover possible weakness in discipline.

h) Make a brief tour of the yard between half-past twelve and one o'clock to note effectiveness of yard duty.

i) Hold brief teachers' meeting after school for discussion of following points:
  (1) Corrections in earlier classification.
  (2) Adjustments to relieve overcrowded classes.
  (3) Settlement of problems incident to the first day of school.
  (4) Preliminary check on pupils who belong to the school but failed to appear.

NOTE.—Departmental and platoon schools will need to devise a different routine for the opening day in that home-room teachers will have to look after new entrants. By having each class report to its home-room teacher for the first period for necessary readjustments, the program can be resumed at the second period without further interruption.

The preparation of material of this type is a very useful service to education. The Department of Elementary School Principals of the National Education Association and a number of other agencies are carrying on studies with a view to collecting material of the type that Mr. Lane has formulated. When much work of this kind has been done, it will be possible to measure the efficiency of a principal as accurately as it is now possible to measure the efficiency of a teacher.

Sooner or later the duties of the superintendent will be defined in equal detail. There will thus come into existence a body of true scientific principles of school administration to replace the vague and unsystematic standards which are now all too commonly accepted.

TRIAL PROMOTIONS

In his report for the year ending June 30, 1926, Superintendent William McAndrew has brought together some of the facts which have recently been compiled regarding the effects of non-promotion and trial promotion of pupils. He concludes his discussion by a vigorous plea to the principals that they exercise the greatest possible discrimination in the promotion of pupils. His paragraphs are so vigorous and cogent that they are quoted herewith.

Effect of repeating grades.—Ever since graded schools and promotions were instituted it has been a common practice to regard promotion as a reward for

effort and success. Pupils failing to reach a designated passing mark—in some systems 60, in some 70, in some 80, in none based on any established or logical data—have remained behind. The theory was that they should earn promotion or that the work of the higher grade could not be done until that of the lower reached 70 or 80, whatever 70 or 80 means. This has become so established as to be generally accepted without question. Now come testers and measurers to find whether compelling a child to repeat a grade does him any good. In Springfield and Decatur, 1,276 children rated unsatisfactory were promoted on a six weeks' trial. Seventy-five per cent of them attained satisfactory marks and remained in the higher grade, from which at the end of the next term they were again promoted. Of the original number failing, there were 86 per cent who sustained themselves on the trial promotion and in the next grade above. The promotion rate in the two cities was brought up to 95 per cent. The promotion rate in Chicago was for all schools: January, 1920, 85 per cent; June, 1920, 87 per cent; January, 1921, 84 per cent; June, 1921, 87 per cent; January, 1922, 84 per cent; June, 1922, 85 per cent; January, 1923, 91 per cent; June, 1923, 91 per cent; January, 1924, 91 per cent; June, 1924, 91 per cent; January, 1925, 91 per cent; June, 1925, 92 per cent; January, 1926, 94.2 per cent; June, 1926, 95.1 per cent. Notice the gains during these years. This means a financial and a vital saving. It justifies commendation for principals and teachers. The danger point, according to reputable educational authorities, has not been reached. By prompt transfer to a lower grade in the case of all pupils suffering from attempting too much, the advantage to the system as a whole will not be impaired.

In Martin's Ferry, by this method the promotion rate was raised to 93 per cent. Vernon Riegel, state director of education, now proposes for Ohio that the trial-promotion plan be put into operation in Ohio where 90,000 pupils each term are left back, involving a large waste. The treatment of repeaters in Springfield, Decatur, and Martin's Ferry followed this procedure: The principal and teacher together scrutinized all the ratings, considered all the circumstances, and, except in cases where they concluded trial absolutely useless, promoted below-grade pupils on a six weeks' probation. During this period weekly reports of progress and pertinent facts recorded by the teacher were inspected by the principal; parents were kept informed and aid solicited; care was taken not to send complaining letters home; the positive and hopeful atmosphere was maintained; brighter pupils assisted slower ones. At the end of the six weeks children found to be in worse condition than they would be in the grade below were restored to the original grade. The benevolent reason for withholding promotion is that by repeating the grade the child may do the work well. McKinney's investigations showed 53 per cent of the repeaters doing no better work; 12 per cent doing poorer work. Keyes' investigations found 36 per cent of the repeaters doing no better and 36 per cent doing worse. Buckingham's conclusions are that only about a third of the pupils who repeat a grade do better than they do the first time. Why, then, mulct the taxpayers the very considerable cost of reteaching this 62 per cent who are marked poor when the reteaching

produces no improvement? This paragraph, therefore, is to advise the principals of the continued need of scrutiny of the pupils' progress reports so as to know early where remedial measures are necessary to strengthen teaching. It is to remind them that the test of the principal's value is his ability to get pupils trained to the promotion point.

THE SABBATICAL YEAR IN KANSAS CITY

For some years past the school system of Kansas City, Missouri, has given a bonus to teachers who attend summer school. Superintendent I. I. Cammack recently announced an extension of the bonus plan to cover periods of absence during the year. Teachers who have been in the service of the school system for six or more years are to be permitted to withdraw for six months or a year for purposes of study or approved travel. On their return, they will receive $20 per school month in addition to their regular salary until the total bonus amounts to $500 for an absence of six months or to $1,000 for a year's absence.

The plan was adopted by the board of education after mature consideration. The board found that, under the laws of Missouri, it would not be legal to pay teachers on leave during the period of their absence because the statutes provide that teachers shall be paid for services rendered. There is nothing in the statutes, however, to prevent the board from recognizing the increased usefulness of a teacher who has spent six months or a year in self-improvement. The plan has the further justification that the city pays for the benefits which come to the school system only if the teacher comes back and serves in the schools for an extended period.

The full text of the Kansas City plan is as follows:

Any teacher, principal, or supervisor who has served six years in the public schools of Kansas City may, on application to the Board of Education of the Kansas City School District and recommendation by the Department of Superintendents, be granted by the Board of Education leave of absence for one year for study, research, and investigation for improvement of herself as a teacher. In view of such study and research, the teacher shall receive twenty dollars ($20) per school month in addition to her regular schedule salary for a period of five years (fifty school months) immediately following such program of self-improvement, provided, however, that the total number of teachers granted leave of absence in any one year shall not exceed fifty and provided, further, that, in selecting teachers for leave, length of service, priority of application, and circumstances affecting the case shall be given consideration. All applications

must be filed in writing on or before the first of May of the year preceding the year of leave. In the event the number of teachers asking for leave of absence for study for a full year does not make the full quota allowed, the number may be filled by grants of leave for a semester. In view of such program of self-improvement, any teacher granted leave for a single semester shall receive twenty dollars ($20) per school month in addition to her regular schedule salary for a period of twenty-five months immediately following such study and research. Applications for leave for a semester must be filed on or before June 1 for the first semester of the school year immediately following, and on or before November 1 for the second semester.

It is further provided that all additional salary shall be subject to the following conditions:

1. That the teacher remains in the employ of the school district and renders satisfactory service.

2. That the study, research, and investigation shall be directly related to the work that the teacher is doing.

3. That the character of this program for self-improvement shall be defined and described in the application for leave in such detail as to make clear the nature of the work.

4. That at least ten semester hours of senior college or graduate work must be done in a standard university not located in Kansas City but equivalent in rank to the University of Missouri.

5. That after a total of ten semester hours of senior college or graduate work has been done the remainder of the year may be spent in such a program of self-improvement as may be approved. In the event the leave of absence is for a semester only, a total of ten semester hours of senior college or graduate work must be done in a standard university.

6. Transcripts of all university work must be submitted to the superintendent of schools and approved by him; also, a detailed report shall be made including all travel and research. This report shall also include a report of the total amount of all compensation received for personal services from September to June during the term of the grant of leave, and all such earnings shall be deducted from the amount to be granted by the Board of Education. In the case of a semester leave, the deduction from the extra salary grant shall include only compensation received for personal services during the semester of leave.

7. That the provisions made by the Board of Education for leaves of absence for study and for additional salary are made expressly subject to the condition that they may be terminated or modified by the Board of Education whenever the operation of the plan, the finances of the school district, or other considerations make it desirable in the judgment of the board so to do.

It is further provided that no teacher shall receive any additional salary for attendance at summer school during the continuation of extra compensation on account of study while on leave of absence.

It is further provided that a teacher may be granted a second leave of

absence for study. However, no second leave of absence shall be granted until the teacher has taught at least six full years in the school system after the last leave of absence. When the leave was for a semester only, however, a second leave of absence may be granted after the expiration of three full years of teaching following the first leave, with the understanding that teachers asking for their first leave or for a full year shall have the preference over those asking for a second leave.

CLASSROOM FILMS

The Eastman Kodak Company, Rochester, New York, has undertaken definite experiments to determine the value of motion pictures in the classroom. At least fifty films will be prepared for the purposes of these experiments. These pictures are not intended for general use in the schools, nor for entertainment. They will be prepared especially for the use of the teacher in her regular, daily classroom instruction. The film should concentrate the thinking powers of the child on the heart of the lesson which the teacher is attempting to teach.

The Eastman Kodak Company will devote two years to these experiments. The films will be restricted to the subjects of geography, general science, and health. They will also be restricted to the fifth, sixth, and seventh grades of the elementary school. The material for these films will be prepared by some of the most successful teachers of these subjects to be found in the country. Committees of experts in the general fields to which these subjects relate will then criticize the proposed films until they are approved for the service for which they are intended.

The experiments will be conducted in the following centers in the country: Rochester, Detroit, Chicago, Kansas City, Denver, New York, Newton, Atlanta, Winston-Salem, and San Diego. Four schools will be used in each of these cities. A system of tests will be devised to evaluate the effectiveness of the film service. If it should be determined that the film is a vital agency in classroom instruction, the Eastman Kodak Company will proceed with the development of a complete library of films to illustrate and amplify the courses of study in the public schools from the kindergarten through the high school. In the development of this program, such experts and such scientific and professional procedure as may be necessary will be employed.

All the resources of the Research Laboratories of the Eastman Kodak Company and the services of its large body of scientific and technical men will be utilized in the development of this program.

The interest which George Eastman, the chairman of the board of directors of the Eastman Kodak Company, has shown in the educational interests of the country, the complete plant essential to the development of a program of this character, the group of scientific men now employed by that company, and the belief that a great national service may be rendered education through classroom films of the type proposed have induced the undersigned to accept an invitation from the company to assume charge of the direction of this special work.

THOMAS E. FINEGAN
Education Director, Eastman Kodak Company

DISCUSSION OF SHORT SESSIONS AND THEIR EFFECTS

The news item which appeared in the September number of the *Elementary School Journal* quoting several paragraphs from the bulletin entitled, *Effectiveness of Half-Time Sessions*, published by the Board of Education of Detroit, elicited the following comment from George A. Mirick, of the Harvard Graduate School of Education.

I feel an inner urge to raise a question regarding this "study" made in Detroit.

It appears that their procedure was a testing by standard tests of the attainments in arithmetic, reading, etc., of the children attending both half and full time. The result showed much lower attainment for the slow and bright pupils in the part-time group. This result might be expected. I am surprised that *all* the pupils attending part time did not show lower scores than those who had been in school full time *on tests taken at the close of the first half-year of school or at the close of the first year of school.*

The question I want to raise is this: Would this difference be apparent also at the close of the second year? From my observation (general) in Indianapolis and throughout the state of New Jersey, I believe that the differences would disappear by the end of the second grade.

We may put the case in another way by saying that pupils attending half time during their first year of school tend to make up the losses in specific knowledge during the full time the second year, so that by the end of the second year, provided they have enjoyed full-time schooling that year, there is no appreciable difference between their attainments and those of pupils attending full time from the beginning.

In other words, it seems to me that Detroit has not used the most significant data in dealing with this question and, therefore, that the conclusions are of doubtful validity and may be *very* misleading.

A NEW MAGAZINE FOR PARENTS AND TEACHERS

Under the sponsorship of sixty eminent specialists in children's health, education, and welfare, a new national periodical, called, *Children, the Magazine for Parents*, has made its appearance with the October issue. "This magazine," it is announced by George J. Hecht, president of the Parents' Publishing Association, 353 Fourth Avenue, New York City, under whose auspices it is issued, "will have no propaganda purpose, being dedicated solely to mothers and fathers, for the sake of a new generation of normal, intelligent, and healthy children. In this it will have the active co-operation of the leading educational and child-welfare agencies, private, public, and governmental."

Among the editors of the new magazine are Julia C. Lathrop, former chief of the Children's Bureau; Angelo Patri, educator and author of books on child training; Glenn Frank, president of the University of Wisconsin; Ben B. Lindsey, of the Juvenile Court of Denver, Colorado; Livingston Farrand, vice-president of the American Child Health Association; Helen T. Woolley, director of the Institute of Child Welfare Research, Columbia University; James E. West, Chief Scout Executive; Sidonie M. Gruenberg, director of the Child Study Association of America; Jane Deeter Rippin, national director of the Girl Scouts; and Bela Schick, discoverer of the Schick test for diphtheria.

Explaining the reason for the issuance of the magazine, Mr. Hecht said:

> There are magazines on the breeding of hogs and dogs, the growing of flowers, the refining of metals; there are magazines for laboring men, radio fans, barbers, beekeepers—for every trade and profession except the greatest of all—parenthood. Billions of dollars are spent on schools, but practically nothing is spent to teach parents how to rear their children. Of ninety-six thousand hours of a child's life between the ages of five and sixteen, only seven thousand are spent in school; the other 90 per cent of the time is the parents' responsibility. The new magazine will have nothing for children to read; it will consider with parents all the varied problems of bringing up children from crib to college.
>
> Generations past have handed on by word of mouth, from mother to daughter and from father to son, the common notions of how to take care of

children. Today we have a science of child-rearing. Doctors in their practice, bacteriologists in their laboratories, psychologists in their clinics, teachers in their classrooms, visiting nurses and social workers in their daily rounds, are finding out things vitally important for parents to know and to practice. A number of our great universities have recently established institutes of child-welfare research which are making important discoveries that should have the widest dissemination among parents everywhere. In the new magazine the results of all this research and study and experiences of parents who have solved difficult problems will be pooled for the benefit of all.

"We recognize," says the editors' statement on the first page of the magazine, "that this magazine must intrigue the interests of fathers as well as mothers. We hope both parents will read it together and discuss it amicably. We should be distressed to have it used by one side of the house as an argumentative weapon of attack upon the other."

Among the contents of the first issue of *Children*, which will be published monthly, are: an article by Ernest R. Groves, of Boston University, entitled, "Inside Tips for Fathers"; an article on "Salesmanship for Parents" by Happy Goldsmith; an article by Dorothy Canfield Fisher entitled, "The Stuff Contentment Is Made Of"; and articles by Helen T. Woolley, Clara Savage Littledale, Robert E. Simon, and Alfred F. Hess.

WORK AS A MEANS OF EDUCATION

It is very gratifying to many who are anxious to be counted as in full sympathy with every rational effort that can be made for the protection of childhood, to note the change in tone which is beginning to appear in the official publication of the National Child Labor Committee. An article published in the October issue of the *American Child*, contributed by Professor R. S. Woodworth, of Columbia University, is the most reasonable comment on the relation of work to education that this magazine has contained for many years. Professor Woodworth is absolutely right. The "thick and thin" opposition to work of any kind whatsoever which has been the policy of the National Child Labor Committee in the past was indefensible and was a menace to the cause for which the committee was organized.

Professor Woodworth's statement is as follows:

Work, in reasonable amount, can scarcely retard the child's mental development, nor injure his emotions or his outlook on life. Earning money can

scarcely injure the child, especially if the money remains his own or is conscientiously devoted to his advantage. Nor is the school such a panacea that we should necessarily keep every child out of gainful occupations till well along in his teens in order to give him the maximum dosage of the schoolroom. The compulsory-education laws undoubtedly work to the disadvantage of many children who are misfits in the schoolroom and subjected to constant humiliation, while out on a job they would have the satisfaction of achievement as well as a better economic condition. It is not absolutely essential that all children should stay in school, or that no children should work for their living. What is most important is that the child should have some free time, time for play and spontaneous activity, opportunity to get acquainted with the world about him and to exercise and develop himself in a variety of ways that are not provided by the set programs of either the school or a job.

Since we cannot depend on an employer, or even on all parents, to make arrangements in accordance with the child's needs and limitations, state supervision is obviously demanded in the interests of the child. Hours of work need to be held down, working conditions made especially favorable. If possible—though our laws and governmental agencies are still very far from anything of this sort—conditions of work, school, and play should be adjusted to the needs and limitations of the individual child. What is good for one child may be bad for another. Blanket regulations, compelling this and forbidding that, are certainly not a scientific, nor even a common-sense, way of meeting our obligations to the rising generation. For all that, some sort of control and supervision by the state is obviously necessary to prevent exploitation of children by parents and employers and to insure every child the opportunity, first, for a healthy and happy childhood and, second, for developing into a healthy and happy adult.

PRACTICAL TESTS OF EDUCATION

The *Journal of Personnel Research* recently published an article entitled, "Clerical Test Scores and Schooling," in which is reported the experience of the Metropolitan Life Insurance Company of New York in testing candidates for clerical positions in the offices of that company.

The following is a summary of the results secured from 4,610 applicants.

Of the 4,610 applicants to whom the mental tests were given in 1922, 1,006 reported the grammar grades as their most advanced schooling; 3,394 reported high school; and 210 reported college. Each group included those who had attended and those who had been graduated from the given type of school. The small number of those reporting college study as compared with the total number examined was due in part to the fact that applicants reporting graduation from certain well-known colleges and universities were not required, in all cases, to take the mental tests.

Average scores for accuracy and speed according to educational groups are reported in Table I. It will be noted that the scores for the high-school group were higher than those for the grammar-school group and that the scores for the college group were higher than the scores for the grammar-school and high-school groups.

TABLE I

AVERAGE ACCURACY AND SPEED SCORES OF APPLICANTS WITH SPECIFIED EXTENT OF SCHOOLING

Schooling	Accuracy	Speed
Grammar school	58.7	66.2
High school	71.8	75.0
College	82.5	85.2

Separate scores in arithmetic, spelling, and handwriting were recorded. Average scores in these subjects, according to educational groups, as shown in Table II, followed the same order as the scores for accuracy and speed of these groups with the exception of the scores in handwriting, which were the same for all groups.

In ten simple arithmetical problems the average achievement of persons with grammar-school training was less than half of a perfect score; of those with high-school training, less than two-thirds; and of those with college training, little more than three-fourths. In spelling, the percentage of achievement of the several groups was even less creditable. In handwriting, each of the three groups had an approximate average score of 50.

TABLE II

AVERAGE SCORES OF APPLICANTS ON SPECIFIED TESTS

Schooling	Arithmetic		Spelling		Handwriting
	On Scale of 15	On Scale of 100	On Scale of 10	On Scale of 100	On Scale of 100
Grammar school	6.9	46.0	3.7	36.6	50
High school	9.6	64.0	5.0	50.0	50
College	11.8	78.7	6.4	64.1	50

The low scores in arithmetic may be partly explained by the fact that the arithmetic test stood at the end of the examination and some of the very slow applicants did not have time to show their ability on that test; the low scores in spelling, by the fact that the spelling test consisted of marking misspelled words in connected discourse, of which the subject matter was the welfare work of the Metropolitan Life Insurance Company for its employees. It is possible that the attention of some applicants was attracted by the subject matter to

such an extent that they overlooked misspelled words which they would have spelled correctly in a conventional spelling test. The low scores in spelling may be due, also, to the method of marking the spelling test. On the scale of 10, one-half point was deducted for each misspelled word which was overlooked. Since forty-two misspelled words appear on the page, it was possible for an applicant to underscore twenty-two of the misspelled words, or 52 per cent of the total errors, and receive a mark of zero for the test. The scores in spelling should be interpreted, therefore, as marks above that minimum accomplishment which for the purpose of marking the test is equivalent to zero.

The handwriting scores were the result of judging by the Ayres handwriting scale the letters of application required of all those seeking employment with the company. Letters from some persons who were not subsequently tested were included, and hence the number of scores in handwriting is greater than the number of scores in arithmetic and spelling.

PUBLICITY FOR SCHOOLS

The Bureau of Educational Research of the Ohio State University has published a pamphlet of sixty pages, prepared by Professor P. R. Stevenson and entitled, *Campaign Publicity for Schools*. The monograph contains a large number of reproductions of posters, handbills, slides for motion-picture houses, and advertisements used in various cities in which campaigns for school bonds or for increases in school revenue have been conducted.

The introductory section describes the type of organization which is to be recommended in the light of the experience of school systems which have conducted successful campaigns. The monograph closes with a bibliography, which will help to make accessible other material of like type.

School administrators will find the suggestions and the concrete materials presented in this monograph very useful in organizing publicity for their systems.

THE RADIO AND THE ELEMENTARY SCHOOL

The *Chicago Daily News* published the following item.

School officers are watching with great interest the efforts of the Connecticut Board of Education and of the officials of the city of Atlanta in utilizing radio broadcasting as an auxiliary for common-school education.

In Connecticut, educators are having receiving sets installed in all the rural schools, where, through the co-operation of station WTIC at Hartford, special programs are heard daily. These programs deal with the subject of music appreciation, but it is planned to extend the scope of the broadcasts so as to include

other subjects pertinent to the classes under instruction in the rural communities. The system may be extended to the urban schools if it proves successful.

In Atlanta, a different plan is in operation. Every school in the city is equipped with a first-class receiving set, and practically every hour of the day one class or another is assembled in a spacious room in the school to listen to instruction via radio. Many subjects are covered, and after school hours children not entered in school and their parents have the privilege of attending what are called the "Atlanta air schools."

So far, both these schemes appear to be working satisfactorily, with the result that school boards in practically all communities are seriously considering attempting it in their districts. Besides the purely instructive features, the children are enabled to receive radio entertainment, something many of them do not have at home.

THE VALUE OF SCHOOL INSPECTION

During the closing days of September a meeting of the village and city superintendents of schools of New York State was held at Lake Placid. An Associated Press dispatch reports one of the important addresses of that occasion as follows:

State supervision of classroom instruction in the schools rather than "inspection" was demanded by Frank P. Graves, state commissioner of education, in an address before the council of school superintendents.

Commissioner Graves explained that mere inspection is negative and destructive and is performed merely for the sake of rating a system, a school, or a teacher.

"Supervision," he explained, "covers all that is included in inspection and goes farther. It uses the facts discovered as a basis for appreciation and creation; it is essentially constructive. It includes helpful suggestions, outlines for supplementary work, and organization of new teaching material. It involves a detailed study of the school and its work, an intimate knowledge of the teachers, repeated visits to each room, careful planning of the work, and frequent and sympathetic personal conferences, with a definite purpose in each interview.

"If properly developed, state supervision would become most fruitful in the improvement of instruction and in the development of a strong *esprit de corps* in the entire teaching profession of the commonwealth."

It may be that the reporter was unacquainted with the technical problems of school administration and therefore misrepresented Dr. Graves in this account. Certainly anyone who has attempted to administer a school knows that there is ample justification at times for straightforward inspection untempered by any effort on the part of the inspector to contribute to the situation. Teachers are employed by the state as trained and presumably competent, responsible

officers. They ought to be able to carry on their work with efficiency. It is one of the duties of a superintendent to see that the assumptions which underlie employment are accepted by the teachers and that the teachers do their duty.

It is entirely legitimate that teachers should ask that inspection be conducted without personal bias, that objective methods of measuring results be employed, and that the inspector be held responsible for his work to the same degree that teachers are held responsible in their spheres. This does not imply, however, the withdrawal of inspection.

Superintendents of schools not infrequently need to be exhorted to have the courage to do some real inspecting and to follow inspection by appropriate action. It will be a sad day for the schools when the clear-cut demands which issue from competent inspection are withdrawn.

THE TEACHERS' MEETING AS AN INSTRUMENT OF SUPERVISION IN A COUNTY-UNIT SYSTEM

I. JEWELL SIMPSON
Assistant State Superintendent of Schools, Maryland

Supervisors seem to have totally different opinions with regard to their work. There is the supervisor who is primarily a school inspector. When he visits a classroom, he notes the discipline, the amount of textbook and course-of-study material covered, and the appearance of the room; he looks at the teacher's register and plan book, listens to her teach for a few minutes, and rates her on the merits of her work as he sees them.

There is the supervisor of rural schools who thinks that his principal function is to socialize the community. He devotes all his energy to organizing and promoting community leagues, to raising money for Victrolas in the schools, to inaugurating the hot lunch in the schools, to establishing circulating libraries, etc. All these things are useful projects, but they are not supervision.

There is also the supervisor who carefully observes the work in all the classrooms under his direction. He recognizes a good teacher when he sees one, and he comments on her merits, but he does not know how to promote her growth. He knows bad teaching when he sees it, and he deprecates it, but he does not know what to do about it; he does not know how to help the poor teacher to become a better one.

Then, there is, fortunately for the schools, the supervisor who believes that his job is to improve the quality of teaching, whether it be in a one-teacher school, in a consolidated rural or town school, or in a splendidly equipped urban school. He knows good teaching and is, himself, a good teacher. Instead of judging a teacher's work by the general-impression method, he bases his estimate of her work on a detailed evaluation of her methods and the results which she

secures. He assists Miss Smith to do better teaching; he shows Miss Brown how to use her textbooks to better advantage; he helps Miss Jones to use all the material at her command in such a way as to keep the brightest pupils profitably employed; he stimulates his strongest teachers to greater professional ability and enthusiasm.

Thus, we have the supervisor who inspects, the supervisor who socializes, the supervisor who observes and comments, and the supervisor who teaches either the teachers or the children as the occasion may require. The last-mentioned supervisor conceives of himself as a teacher of teachers. In his work with teachers there is the general understanding that, being a teacher of teachers, he is subject to the same principles as are the teachers when they teach children.

It is the school officer who is first and primarily a *teacher*, second a *supervisor*, and then an *executive* whom the writer has in mind. This teaching supervisor or supervising teacher, whichever one likes to call him, knows that his teachers have group needs and that they have individual needs, and he plans to meet both, just as a strong classroom teacher not only provides group activities which are designed to promote the physical, mental, and social growth of all her pupils but also carefully considers the fact that there are individual differences among them and that the pupils must be handled in small homogeneous groups and also as individuals. She has dull pupils and bright pupils, lazy pupils and industrious pupils, sullen pupils and cheerful pupils, selfish pupils and generous pupils, pupils with exceedingly poor home environments and pupils with exceedingly good home environments. She endeavors to develop each pupil in accordance with his particular aptitudes and abilities.

It is just this type of thing that the supervisor tries to do with his teachers. During the classroom visit the supervisor gives individual instruction based on the needs of the particular teacher. At a teachers' meeting the supervisor does group teaching. A teachers' meeting is analogous to a classroom recitation, and, in the effort further to professionalize the teachers' meetings in Maryland, the slogan has been accepted, "Every teachers' meeting a skilful teaching act." This means that the teachers' meeting must contain all the elements which contribute to the effectiveness of a good lesson.

Workable groups.—Does this slogan call for the homogeneous

grouping of teachers? To what extent is the similarity or the dissimilarity of the individuals in the group a factor? Will the teachers' meeting be more fruitful if groups with similar needs and interests are brought together? What is a good working group from the standpoint of numbers?

The needs of teachers in one-room schools are usually different from the needs of teachers in large graded schools; the interests of teachers of the primary grades are different from the interests of teachers of the grammar grades. In the departmentalized grades of the elementary school and in the high school there are teachers who teach certain subjects only. Moreover, most supervisors have to deal with teachers who differ widely in native ability, in training, and in attitude toward their work.

It seems evident, therefore, that, in making plans for a series of teachers' meetings, one should consider the personnel of the group. Someone has said that the ideal attributes for a teachers' meeting are "equality, fraternity, and participation." Are these attributes sufficiently in evidence "where the teaching situations are unlike, where professional equipments are very dissimilar or unequal, and where the purposes of the teachers are very divergent"?[1]

Studies have been made to ascertain the extent to which size of class affects the results of teaching. Is the size of the group a factor at a teachers' meeting? Can you get better discussion with a group of more than one hundred teachers or with a group of thirty? Is a group of from eight to ten teachers too small? Where do you get better thinking and expression? What is the best size for a working group of teachers?

W. H. Kilpatrick, of Columbia University, one of the greatest teachers the writer knows, handles 150 or more students in his summer-school classes in the philosophy of education. He conducts one type of discussion with the whole class together, and in the course of the six-week term many of the students participate in the discussion. Dr. Kilpatrick recognizes the importance of another type of discussion by dividing the class into groups of ten students each, which meet daily and discuss their problems in an informal way. It is in these small groups that every member of the class participates

[1] Marvin S. Pittman, *Successful Teaching in Rural Schools*, p. 24. New York: American Book Co., 1922.

in the discussion every day. It is in these small groups that the student says what he really thinks. Sometimes in the larger group he is tempted to say what he thinks the instructor wants him to think.

It would seem, therefore, that the size of the group of teachers affects the type of discussion and the amount of participation per individual.

The writer recently visited a first-grade class of forty-two pupils. The teacher deals with all the pupils when she teaches them a song, when she talks to them about birds and trees, when she teaches a lesson in hygiene, when she reads a story, or when the class is having rhythmic exercises. She divides them into groups, however, for their reading lessons and for their number work.

It would seem, therefore, that the size of the working group of teachers should be determined in large measure by what one is trying to do.

When the personnel of the group of teachers and the size of the group have been considered, there is the question of the frequency of the meetings, the length of the meetings, and the time and the place of the meetings.

In Detroit, Michigan, and in a number of other cities, the school officers believe in short teachers' meetings, and meetings are held from four to five o'clock, beginning promptly and ending promptly. Is that a good time of day for meetings? It would seem that, if teachers are to do real thinking on real problems—Why have a teachers' meeting if not for that purpose?—a time should be selected when the teachers are not tired. They are likely to be very tired from four to five o'clock.

In the Maryland counties the teachers' meetings are, for the most part, held on school days. Sometimes there is an all-day meeting, from 9:30 A.M. to 3:30 P.M. More often there is an afternoon meeting from one to four o'clock. Teachers have a better attitude toward the meetings if they are not held on Saturday. They assume a more definite responsibility for them if they are held on teachers' work days.

At first, the parents thought that it was not "tending to business" to close school for a teachers' meeting, but the procedure was justified on the ground that what the teachers carried back to the

pupils from the teachers' meeting was of more value to the pupils than what they would have gained if they had been in school all day. The minimum school year of 180 days also helps to take care of this situation.

The evening, from seven-thirty to ten o'clock, is also a favorable time for thinking and working together if the teachers can be assembled then.

Types of meetings.—There are various types of professional teachers' meetings. One of the most effective types is the meeting at which demonstration teaching takes place under supervised observation and is followed by an analysis of the lesson or lessons observed. At least once each year every teacher should be afforded an opportunity to see lessons in the subjects and grades she herself teaches. It is better not to observe too many lessons at one time, however, or at least not to attempt the analysis of too many lessons, else the discussion may be scattered and the teachers may leave with a feeling of having seen much attempted and little accomplished.

The demonstration lesson provides a basis for intelligent discussion. It gives concrete illustration of the abstract theory expounded in the regular group meetings and presented in the bulletins, reprints, and mimeographed sheets distributed to the teachers throughout the year. Some persons have the ability to grasp a method through verbal descriptions, but many individuals are so constituted that they must be shown how to apply a principle. It is also true that many individuals observe very inaccurately. For this reason a simple outline should be in the hands of the teachers, which will aid them in their observation and will guide them in taking such notes as they will need in discussing the lesson procedures critically.

A simple plan for observation used to good advantage by a group of teachers of the third and fourth grades is as follows:

As a basis for our afternoon discussion, you will need to note the following points:

1. The steps in the procedure of each lesson taught
2. The ways in which the teacher works for—
   a) Acquisition of facts by pupils
   b) Formation of desirable habits and attitudes
3. The ways in which time is economized
4. The provision made by the teacher to meet the needs of individual pupils

The demonstration meeting stands out pre-eminently as a type of meeting characterized by purposing, planning, executing, and judging. It is an example of that type of project outlined by Dr. Kilpatrick the purpose of which is *to embody some idea or plan in external form.*[1]

Another type of meeting is the meeting preliminary to the opening of school—a working conference of teachers and supervisors—when local educational problems and policies are studied and discussed and when high standards or objectives are set up. Such a meeting as this promotes and unifies local plans, inspires professional idealism, and develops *esprit de corps.*

A distinct type of teachers' meeting is that held subsequent to a testing program in which standardized subject-matter tests have been used. Here the findings of the tests are carefully studied and correctives discussed. The teachers are shown effective ways of graphing the results to diagnose class weakness and strength, to reveal individual difficulties, and to stimulate pupils to effort. Such a meeting might be regarded as an example of the type of project outlined by Dr. Kilpatrick the purpose of which is *to obtain some item or degree of skill or knowledge.*

Of a like practical purpose is the type of teachers' meeting at which the teachers study the principles underlying educative seat-work assignments, examine effective models, and devise seat-work exercises in reading, arithmetic, spelling, geography, and history. Committees of teachers pass on the educative value of this seat work, after which the assignments are distributed among all the schools.

A distinct type of teachers' meeting is that held for the purpose of considering problems of classification and promotion. A study was recently made by a county supervisor of the number of over-age children in the various grades of twenty large graded schools and of the large number of children enrolled in the first and second grades as contrasted with the number enrolled in the seventh and eighth grades. This investigation was followed by discussions with teachers in large and small groups in an effort to locate the causes and to

[1] William Heard Kilpatrick, *The Project Method: The Use of the Purposeful Act in the Educative Process*, p. 16. Teachers College Bulletin, Tenth Series, No. 3 (October 12, 1918).

remedy the conditions. Promotions were surveyed over a four-year period. After studying the factors responsible for slow progress—incorrect classification, varying standards for promotion, poor attendance, and poor teaching—the teachers adopted definite standards for promotion, which are rapidly remedying the situation in the county. This type of meeting is probably an example of the type of project outlined by Dr. Kilpatrick the purpose of which is *to straighten out some intellectual difficulty—to solve some problem.*

There is no finer type of meeting than that concerned with the making or the revising of the course of study or that designed to insure the proper interpretation and use of the course of study. The writer recently attended an all-day meeting at which twenty-five teachers, under the leadership of the supervisor, were engaged in revising the course of study in English. A group of well-trained rural teachers participated in this meeting. They had some lively arguments; they reached some valuable conclusions. They were demonstrating the fact that the most valuable thing about the course of study to a group of teachers is the course of study *in the making;* the least valuable is the course of study *already made.*

Underlying principles.—How may a teachers' meeting exemplify the principles and procedures of a "skilful teaching act"?

Skilful teaching is likely to be the result of skilful planning. Skilful planning means planning to some purpose. It would seem, therefore, that *the meeting must be carefully planned and carefully assigned—must be definite and purposeful.* A teachers' meeting which provides for purposing, planning, executing, and judging is a skilful teaching act, but it must be purposing, planning, executing, and judging on the part of both supervisor and teachers. A professional teachers' meeting is not alone the supervisor's project; it is the teachers' project as well. A teachers' meeting is not a unit within itself. It is part of the supervisor's work and part of the teachers' work. The purposing and planning have to begin long before the meeting. They have their inception in certain needs that are outstanding among the teachers. Most teachers know their own needs and weaknesses. The supervisor recognizes these needs, and a part of his job is to bring those teachers who do not seem to know their own needs to a realization of them. The teachers should help to

organize the meeting by suggesting some of the problems to be discussed; before the meeting they should try to organize their thoughts around these problems; they should participate in the solution of these problems.

A skilful supervisor senses the needs of the teachers and devises means of meeting these needs. Let us accompany him as he visits some of the teachers.

In one class he notices that there is a lack of interesting and challenging educative seat-work activities. This teacher admits that during the time between recitations she cannot keep the children occupied in a worth-while way.

In another classroom the supervisor notices that the children are getting tidbits of knowledge in a haphazard fashion. This teacher admits that the pupils do not know how to study.

In another classroom the supervisor notices that, although most of the children know their lesson, they are doing no real thinking and that they apparently have little real interest in their work. There is no enthusiasm. This teacher admits that she needs help in organizing subject matter in large units around problems.

In another classroom the supervisor notes the opposite condition. Here the children are sensing and solving problems which are related to a larger unit. The children are thinking; their attitude toward their work seems excellent. Some desirable "concomitants" are evident. The pupils, however, betray a meager knowledge of certain facts which they should have mastered in previous lessons. Nothing in particular is emphasized. This teacher admits that her lesson plan does not provide for review, drill, summary, or clinching—those elements which make for thoroughness in the learning process.

Of course, this skilful supervisor has given assistance to each teacher in the classrooms visited—assistance in the matter of educative seat work, assistance in the matter of guiding children in right habits of study, assistance in the matter of problem-solving related to large units of subject matter, and assistance in the matter of guarding against lackadaisical teaching. That is not enough, however. He plans a teachers' meeting centered around a problem based on the needs common to these teachers, namely, "How may we plan our daily work so as to make our teaching more effective?" As part

of the assignment for the meeting, the supervisor asks the teachers to consider questions such as these:

1. Do you believe in preparing daily for your work? Why?
2. What is a reasonable length of time to spend on such preparation?
3. Do you use a plan book? If so, bring it with you and be prepared to explain its value to the group.
4. What difference do you make in your thought on plans for the social studies as compared with plans for spelling and arithmetic?
5. Do you plan for more than a day's work at a time? Why?
6. Would there be an advantage in checking over your written notes of preparation after having used them; in other words, is there an advantage in having an achievement record?

Of course, at the teachers' meeting this skilful supervisor keeps in mind the needs of individual teachers as well as the needs of the whole group of teachers. For example, one teacher may be encouraged to work particularly on finding and formulating, or guiding children to find and formulate, worth-while problems; another may be encouraged to work particularly on summaries—one type of summary at the beginning of a history lesson, other types of summaries to clinch small units in the course of the lesson, and still a different type of summary at the end.

Out of the meeting should develop and crystallize certain fundamental ideas and attitudes toward the planning of lessons, one idea being that a teacher should write into a lesson plan only what will be useful to her in her teaching. The degree of detail will depend on the subject to be taken up, on the teacher's familiarity with that subject, and on the particular needs of the teacher.

In the case of lesson plans, some teachers tend to substitute the form for the spirit. The thing to be avoided is a stereotyped, formal plan book. This means that the teachers' meeting must be carefully followed up. There must be a very close connection between the teachers' meeting and the follow-up work in the schools afterward.

Besides sensing the needs of teachers and thus finding problems for teachers' meetings during the course of classroom visits, the supervisor finds problems through other sources. At the first meeting of the year the teachers may decide on the year's objectives. Often one teachers' meeting suggests problems for another meeting. Teachers frequently make requests that certain work be given at a

teachers' meeting. Another means of arriving at the needs of teachers is to study the results of standardized tests.

A teachers' meeting, then, if it is "a skilful teaching act," must meet a second requirement, namely, *it must be organized around the needs of the teachers. There must be an apperceptive basis if the meeting is to be of real interest to the group.*

Some simple tests of interest and attention are: Do teachers pay attention? Do they ask questions? Do they seem bored? Do they take notes? Are they anxious to take away with them what the supervisor has to offer? Do they seem to have a feeling of responsibility toward the meeting? Are they ready to leave before the meeting has adjourned?

A teachers' meeting needs to habituate certain teacher attitudes, skills, and feelings. Certain principles and accepted procedures must be presented again and again at teachers' meetings so that they become ingrained in the consciousness of the teachers. For example, such things as these need to be habituated in their thinking: limiting the amount of oral reading in the upper grades; handling large primary classes in sections; drilling on phrases, not words; providing educative seat work, not busy work; teaching spelling as a tool of written language; avoiding the overteaching of the appreciation lesson. Sometimes it is very difficult to habituate these things. It has been said that, if we had not the power of forming habits, it would take us half a day to put on our clothing and the other half to remove it. It is equally true that "a teacher who fails to reduce much of his conduct in the classroom to habitual action, and to acquire general principles to guide him in meeting the multitude of situations which confront him in the course of a day, will accomplish little and will soon be worn out."[1]

Supervisors recognize the importance of frequent recall in this matter of "making a teacher into a bundle of functioning habits."

To be a "skilful teaching act" a teachers' meeting must meet a third requirement, namely, *it must provide for free expression of opinion and for discussion by as many members of the group as possible—a maximum of teacher participation under the careful guidance of the supervisor.*

[1] William E. Stark, *Every Teacher's Problems*, p. 356. New York: American Book Co., 1922.

There are several methods of securing teacher participation. One method is by means of the assignment.

An outline of what is to take place at the meeting, an assignment of topics for a round-table discussion, or a set of questions dealing with the course of study may be sent out in advance. Thus, teachers may be held responsible for more than mere attendance at the meeting. This precaution is absolutely essential to thoughtful reaction on their part.

An assignment may be made to an individual teacher, but, if her name is placed on the program, sometimes the other teachers may not feel responsible for thinking through that particular part of the assignment. A meeting may be so carefully assigned, with certain leaders designated to introduce certain topics, that it is stereotyped so far as any discussion is concerned. Sometimes, on the other hand, unless certain leaders are designated to introduce certain topics, the meeting does not get very far.

Teachers can participate in teachers' meetings by discussing problems, by making committee and individual reports, by teaching lessons before the group, and by asking questions. They can participate by manifesting a critical attitude toward the suggestions of the group or of the supervisor and by judging of the value of such suggestions. They can participate by being able to accept criticism in the right spirit.

The last-mentioned method of participation may be a very high type, but this matter of criticism needs careful attention for obvious reasons. To be able to accept sincere criticism in an impersonal way is one measure of professional growth. In a teachers' meeting teachers should be free to express their opinions on the validity of the suggestions given. The suggestions supervisors give are not always practical.

After all, what is real teacher participation? For that matter, what is real pupil participation? Sometimes all the children in a class raise their hands at every question and manifest great eagerness to answer. Is that what is meant by pupil participation? The writer has attended teachers' meetings at which almost everyone talked, and it was agreed that there was "wonderful" participation although there was little contribution. If an individual talks but does not con-

tribute, has he really participated in the meeting? If some remain quiet throughout the meeting, is not that sometimes better participation than if everyone says something?

In the matter of teacher participation, how does the skill of the supervisor manifest itself? Surely, in his method of handling the contributions: by the way in which he lets the members of the group handle one another's contributions, by the way in which he keeps the discussion to the point, by the way in which he helps teachers to shape and to summarize their own contributions. A skilful supervisor can often take a very poor contribution and, by sifting it or perhaps by padding it, make it into a worth-while contribution.

A fourth requirement for the teachers' meeting if it is to be a "skilful teaching act" is that *it must be related to what has preceded and it must lead on*—lead on by setting standards for better work, lead on by being a source of inspiration to the enthusiastic, wide-awake teacher, urging her to further effort. Do the teachers take away from the meeting more than they bring to it? Can a supervisor judge the success of the meeting by what the teachers get from it—by what he sees in his subsequent visits to them?

To summarize briefly, in order to be a "skilful teaching act," a teachers' meeting (1) must be carefully planned and carefully assigned—must be definite and purposeful; (2) must be organized around the needs of the teachers and must have an apperceptive basis if it is to be of real interest to the group; (3) must provide for free expression of opinion and for discussion by as many members of the group as possible—a maximum of teacher participation under the careful guidance of the supervisor; (4) must be related to what has preceded and must lead on.

The supervisor who conducts his teachers' meetings in accordance with these standards is practicing democracy in supervision. His philosophy of education is primarily concerned with developing unity of zeal and purpose, not with developing uniformity of ideas and practices.

THE SCHOOL PUPIL SURVEY IN ARITHMETIC: A 1925 COMPARISON[1]

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During the autumn of 1925 a group of students in a course in "Arithmetic Reconstruction" in Boston University decided to make a survey of the uses of arithmetic in order to see whether practices in the Boston area would show data at variance with the findings of other surveys or whether the present level of prices would affect the distributions. Each member of the class canvassed a number of pupils and obtained the problems in arithmetic encountered by their parents in the course of their ordinary experiences during a period of two weeks. The combined efforts of the class secured 5,463 problems in Boston and vicinity—Roxbury, Dorchester, Jamaica Plain, Milton, Somerville, and Randolph.

The data were classified according to the Wilson plan in general, but use was made of some of the refinements of classification introduced by Wise and other students of the problem.

Table I shows the types of persons who contributed the problems. There are sixty-two different occupations represented.

The general nature of the problems is shown in Table II. Of the 5,463 problems, 5,286, or 96.8 per cent, are general problems. It is interesting to note that 177 of the problems, or 3.2 per cent, are classified as vocational. This is a significant variation from other surveys and is explained by the unusual efforts of one of the surveyors in gathering the daily figuring from a highly specialized group. This group furnished problems in cost accounting, discount sales, and income-tax returns. Table II also shows the classification of the problems as informational or computational.

The survey group disbanded before completing the survey on a satisfactory basis. The returns as tabulated were confirming the

[1] To be published as a chapter in *What Arithmetic Shall We Teach?* (Houghton Mifflin Co.)

TABLE I

OCCUPATIONS REPRESENTED IN SURVEY

Occupation	Frequency	Occupation	Frequency
Architect	1	Mason	1
Bobbin-winder in shoe factory	1	Mechanic	1
Bookkeeper	1	Milkman	1
Carpenter	2	Motorman	1
Cashier	1	Musician	2
Chemist	2	New England telephone clerk	1
Clerk	1	Newsboy	1
Collector	1	Nurse	1
Conductor	2	Oiler	1
Contractor	1	Painter	1
Coverer of wooden heels	1	Policeman	1
Curtain manufacturer	1	Provision dealer	1
Dentist	1	Reader of gas meters	1
Dressmaker	1	Real-estate agent	1
Electrician	1	Retail merchant of tailors' trimmings	1
Elevator operator	1	Salesman	1
Elevator repairer	1	School custodian	1
Engine watchman	1	Secretary	1
Engineer	2	Shoe salesman	1
Expressman	1	Social worker	1
Foreman in factory	1	Stenographer	1
Fruit dealer	1	Storekeeper	2
Garage worker	2	Tailor	1
Health inspector	1	Teacher	1
Horseshoer	1	Teamster	1
Housekeeper	16	Telegraph operator	1
Inspector	1	Tire salesman	1
Insurance agent	1	Western Electric worker	1
Lawyer	1	Wholesale card house owner	1
Leather dealer	1		
Leather sorter	1	Total	84
Librarian	1		
Manager of store	1		

TABLE II

GENERAL CLASSIFICATION OF THE PROBLEMS

Type of Problems	Number	Percentage
General	5,286	96.8
Vocational	177	3.2
Total	5,463	100.0
Informational	69	1.3
Computational	5,394	98.7
Total	5,463	100.0

findings in other surveys so completely that the group decided that it need not complete the work. However, Tables III–XII show significant data, and, while the totals do not check accurately, the tables will afford profitable comparisons.

TABLE III

DETAILED CLASSIFICATION OF PROBLEMS INVOLVING FUNDAMENTAL PROCESSES

Process	Number of Problems	Percentage of All Problems
Addition	854	15.632
Subtraction	870	15.925
Multiplication	1,390	25.444
Division	231	4.228
Addition and subtraction	159	2.910
Addition and multiplication	492	9.006
Addition and division	22	0.403
Addition, subtraction, and multiplication	182	3.332
Addition, subtraction, and division	3	0.055
Addition, multiplication, and division	10	0.183
Subtraction and multiplication	148	2.709
Subtraction and division	25	0.458
Subtraction, multiplication, and division	3	0.055
Multiplication and division	42	0.769
Total	4,431	81.109

TABLE IV

DATA ON SIZE OF LARGEST ADDENDS

Number of Places	Number of Problems	Percentage of Problems	Percentage Distribution in Wilson Survey
1	38	1.56	1.8
2	1,201	49.40	48.5
3	818	33.65	37.5
4	285	11.72	10.6
5	72	2.96	1.5
6	14	0.58	0.1
7	2	0.08	0.0
8	1	0.04	0.0
Total	2,431	99.99	100.0

Table III shows the data with regard to the four fundamental processes. They show that a total of 81 per cent of all the problems are in the fundamental processes, and they show, as usual, that multiplication is the most used process.

Tables IV–VII show data on the size of addends, minuends, multipliers, and divisors. The data are compared with data from the Wilson survey (1918). In the case of each of the four items of

TABLE V

DATA ON SIZE OF MINUENDS

Number of Places	Number of Problems	Percentage of Problems	Percentage Distribution in Wilson Survey
1	13	1.00	7.8
2	160	12.35	32.8
3	590	45.52	38.9
4	407	31.40	17.9
5	109	8.41	2.4
6	16	1.23	0.3
7	0	0.00	0.0
8	1	0.08	0.0
Total	1,296	99.99	100.1

TABLE VI

DATA ON SIZE OF MULTIPLIERS

Number of Places	Number of Problems	Percentage of Problems	Percentage Distribution in Wilson Survey
1	1,751	66.53	53.1
2	787	29.90	39.2
3	66	2.51	6.9
4	19	0.72	0.8
5	2	0.08	0.0
6	3	0.11	0.0
7	1	0.04	0.0
8	3	0.11	0.0
Total	2,632	100.00	100.0

TABLE VII

DATA ON SIZE OF DIVISORS

Number of Places	Number of Problems	Percentage of Problems	Percentage Distribution in Wilson Survey
1	140	43.48	39.6
2	155	48.14	43.4
3	22	6.83	12.8
4	4	1.24	4.1
5	1	0.31	0.1
Total	322	100.00	100.0

comparison, the medians fall at the same point, and the figures throughout show remarkable similarity. The 1925 survey shows a larger percentage of one-place multipliers and one-place divisors. On the other hand, the minuends show a tendency to become larger. This is doubtless due to higher prices, but why the same tendency

TABLE VIII

DATA ON NUMBER OF ADDENDS

Number of Addends	Number of Problems	Percentage of Problems
2	349	15.41
3	659	29.09
4	479	21.15
5	296	13.07
6	171	7.55
7	93	4.11
8	73	3.22
9	38	1.68
10	28	1.24
11	24	1.06
12	9	0.40
13	12	0.53
14	7	0.31
15	7	0.31
16	1	0.04
17	3	0.13
18	7	0.31
19	1	0.04
20	2	0.09
21	1	0.04
22	1	0.04
23	1	0.04
24	1	0.04
25	1	0.04
26	1	0.04
Total	2,265	99.98

does not appear in the case of addition is not evident. It may be due to higher wages and the resulting fact that purchasers have more ten-dollar bills in their purses. A ten-dollar bill offered in payment means a four-place minuend in subtraction in making change, while a five-dollar bill means only a three-place minuend.

Tables VIII–X show data relative to the number of addends and the size of multiplicands and dividends. They confirm the findings of earlier studies showing the simplicity of the figuring of the average adult.

Table XI shows the distribution of the 2,786 fractions. The fraction 15/16, reported by a tailor, relates to trimmings, 15/16 of an inch. The fraction 14/19 came from the superintendent of a card factory. He was figuring on how to cut large sheets of paper to the

TABLE IX

DATA ON SIZE OF MULTIPLICANDS

Number of Places	Number of Problems	Percentage of Problems
1	252	10.00
2	1,334	52.96
3	561	22.27
4	246	9.77
5	102	4.05
6	17	0.67
7	7	0.28
Total	2,519	100.00

TABLE X

DATA ON SIZE OF DIVIDENDS

Number of Places	Number of Problems	Percentage of Problems
1	3	1.18
2	89	34.90
3	97	38.04
4	49	19.22
5	10	3.92
6	4	1.57
7	1	0.39
8	1	0.39
9	1	0.39
Total	255	100.00

best advantage in making cards for a library. The situation is surprisingly simple, notwithstanding the fact that the study includes 177 problems classified as vocational.

The vocational figuring accounts for the appearance of decimals aside from United States money. There are 112 such decimals. Nine three-place decimals and four four-place decimals were reported by a naval engineer; they relate to such matters as distances (feet or inches carried to three or four decimal places), soundings, and instrument readings. Of the ninety-eight two-place decimals, fifty-eight

were reported by an efficiency expert; they refer to percentage of output; the others relate to discounts. The discounts of 5, 10, 15, and 20 per cent constitute 80 per cent of all the discounts. The remaining decimal of the 112 is a one-place decimal.

TABLE XI

DATA ON FRACTIONS

Fraction	Frequency	Per Cent
1/2	2,534	90.955
1/4	80	2.872
3/4	68	2.441
1/3	35	1.256
5/8	14	0.503
1/8	12	0.431
2/3	11	0.395
7/8	8	0.287
3/8	7	0.251
1/6	5	0.179
3/16	2	0.072
1/5	2	0.072
3/5	1	0.036
4/5	1	0.036
5/6	1	0.036
1/10	1	0.036
3/10	1	0.036
7/15	1	0.036
15/16	1	0.036
14/19	1	0.036
Total	2,786	100.002

The general conclusions from this study are not different from the conclusions drawn from similar earlier studies. At the beginning of the survey it was agreed that particular attention should be given to fractions, denominate numbers, and decimals. The data on fractions and denominate numbers show no significant differences. The fractions are simple. The denominate numbers do not occur except as simple measures—cents, dollars, yards, quarts, etc.; there are no reductions; there are no compound number processes. Aside from those reported by a cost accountant, an efficiency expert, and a naval engineer, the decimals relate to simple discounts.

AN ANALYSIS OF STUDY QUESTIONS FOUND IN TEXTBOOKS FOR THE INTERMEDIATE GRADES

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A common criticism of our schools is that they do too much teaching of facts and too little developing of the ability to think. The pupil's habits and attitudes toward study are determined largely by classroom procedures. If the teacher guides the pupil's study through types of assignments that center attention on the getting of facts from the printed page, the child is likely to think that the memorizing of facts is the desirable outcome of study. If, on the contrary, the teacher guides the pupil's study through the use of properly selected problems or thought questions, the pupil is in a position to recognize the need for acquiring facts, and he forms habits of reflection and application.

Textbooks have a large influence on classroom technique, utilizing the question as the chief instrument for testing the activities of the pupil in his study. Analysis of the questions used in representative textbooks in the three subjects which furnish the bulk of the work type of reading—reading, history, and geography—should throw some light on present tendencies in practice. In an attempt to determine the mental abilities which the exercises were designed to develop, an analysis was made of the study questions and directions found in eighteen texts in reading, history, and geography used in Grades IV, V, and VI.

Explanation of the scheme of classification.—The basis for the classification of the questions is found in the types of mental processes required in interpreting and answering the questions. Two general classes are found: (1) memory questions and (2) thought questions. In determining the classification of a question, the examiner read both the question and the facts the author presents for use in answering it. All questions which can be answered with facts as given in the text have been classified as memory questions without regard for the form in which the questions are stated. Questions

which call for independent use of facts have been classified as thought questions.

In order to make clear the distinctions made between the different types of questions found in the study, explanations of the classifications used and sample questions of each type are here given.

THE SCHEME OF CLASSIFICATION

I. *Memory questions.*—All questions involving selective reading and memory of facts given in the text directly have been classified as memory questions. Such questions have been found to fall into two classes:

1. *Questions calling for selective reading and memory of isolated facts.*—Single details, such as dates, names of persons, places, or things, have been considered isolated facts. Examples: "Of what were his arrows made?" "Who else came home on that ship?" "Where was Andrew Jackson born?" "When did the Revolution begin?" "What is the capital of Russia?"

2. *Questions calling for reading, grasping, and remembering an organized body of material.*—A series of ideas the relationships of which must be grasped and reported in the sequence presented by the text has been classed as an organized body of facts. Every question which calls for grasping an organization, from a simple explanatory statement to a series of paragraphs, has been included in this classification. Examples: "What story did the knight tell to Robin Hood?" "What ideas about religion and government did the Puritans bring with them to America?" "How do desert people live?" "How does the Eskimo make a canoe?"

II. *Thought questions.*—All questions requiring independent use of facts have been classified as thought questions. These questions have been divided into classes based on the mental processes involved in the various uses of the facts:

1. *Causal reasoning.*—This type calls for finding the relation between cause and effect, seeing underlying reasons or motives, or recognizing certain happenings as results of certain situations.

a) *Causal reasoning.*—Examples: "Why was it so difficult to travel by water at the time of Sinbad?" "Why did the discovery of America by the Northmen have no important results?" "What are

the dangers of alliances among nations?" "What connections do you see between trade and spread of civilization?"

b) *Causal reasoning based on analogy.*—This type is more complex than "causal reasoning" since the pupil must trace causes for similarities and differences between situations. Examples: "Why is a tall chimney better than a short one?" "Why did the Indians use birch-bark canoes instead of boats?" "Why was the voyage of Raleigh's colonists less dreaded than that of Columbus?" "How do you account for the differences in character between the Spartans and the Athenians?"

c) *Causal reasoning and judgment.*—In this type of question the pupil is asked to trace relationships and to pass judgment on the adequacy, accuracy, consistency, relevancy, or moral correctness of acts or happenings. Examples: "Were the conquests outside of Italy good or bad for Rome? Why?" "Was an escort needed by the families who were moving west down the Ohio River? Give reasons." "What right had the colonists to destroy the Indian villages?"

d) *Causal reasoning based on analogy and judgment.*—This is a more complex type of question. It involves a combination of the processes in the two preceding types. Examples: "Which had the better claim to the English throne, William or Harold? Why?" "Does Athens or Sparta deserve the greater credit for saving Greece from the Persians? Why?"

2. *Comparison or contrast.*—In this type of question the pupil is asked to find likenesses and differences between persons, places, situations, or events. Such questions have been grouped into four classes according to these demands:

a) *Finding likenesses only.*—Examples: "In what ways were the Teutons like the American Indians?" "In what ways are North America and South America alike?" "In what way is an oasis like an island?" "In what way are the little boats like viking boats?"

b) *Finding differences only.*—Examples: "In what way did the governments of all but one of these nations differ from the 'dragon'?" "What differences do you see between the shores of Greece and those of Italy?"

c) *Finding likenesses and differences.*—Examples: "Compare his methods of travel in winter with those in summer." "Compare the

Christmas messengers in Russia and America." "Compare our Indians with the early Germans." "Compare a Venetian vessel with a modern steamship."

d) *Comparison and evaluation or choice.*—Examples: "Would you prefer to have been a Spartan or an Athenian?" "What one of the Anglo-Saxon moots was most like our state legislature?"

3. *Reorganization of facts—grouping.*—This type of question calls for selecting facts from different places in the text and arranging them with reference to conditions imposed by the question. Such questions have been grouped into two classes:

a) *Grouping only.*—Examples: "Make a list of Robinson Crusoe's inventions." "List the colonies you have studied in the order in which they were settled." "Make a list of all the things we inherited from the Romans." "List the different forest products you have studied in this book."

b) *Grouping and evaluation or choice.*—This type of question requires the pupil to select and assemble facts from different places in the text in order to evaluate them correctly or requires him to assemble facts according to a preliminary evaluation which he has placed on them. If the facts have been evaluated by the author, the question has been classed as one of reorganization by grouping. Examples: "What good deeds did he do with his money?" "List what seems to you to be the most important requests in the prayer." "Make a list of famous Greek men." "Make a list of Edison's great inventions." "Make a list of the chief railroad centers in this group of states."

4. *Reorganization of facts—imagination.*—In this type of question the pupil is required to construct in his imagination scenes that conform to the facts of the situation as given in the text, or he is required to construct experiences or scenes unlike any he has ever experienced or encountered in his reading. Such questions are grouped into different classes:

a) *Reconstructive imagination—mental picture or mental picture and verbal expression.*—In this type of question the pupil is required to put himself in another's place and to visualize the thoughts and feelings or experiences of the other person or to put himself in another situation and to visualize the scene as if he were an actual

observer. Examples: "If you were an Indian boy or girl, how do you think you would feel during the winter about the summer trip to the trading post?" "Imagine yourself a page and write a letter home telling of your life." "Write a letter describing the changes in farm scenes as one passes in late June from Cincinnati to the northwestern part of North Dakota."

b) *Reconstructive imagination involving constructive expression.*—In this type of question the pupil is required to express through some form of constructive activity the ideas imagined. Examples: "Draw silhouettes of scenes on a Roman road as the Greek vase-painter would have made them." "Draw a picture of Dibby at the fair." "Model a castle in clay, each one in the class making one building or a part of the wall." "Show by a globe, or a ball, how the two movements of the earth can take place at the same time."

c) *Constructive imagination.*—In this type of question the pupil is required to put ideas together in a way different from the ways in which they have been put together in his experience or in his reading. Examples: "Suggest another ending to the story." "What would it have meant to the world if the Persians had conquered the Greeks?" "Suppose that all printing presses were destroyed tonight; what differences would it make in our world?"

d) *Constructive imagination involving constructive expression.*—Examples: "Try to invent an alphabet unlike any that you have ever seen." "Try to write a message by means of pictures."

5. *Interpretation of the author's meaning.*—In this type of question the pupil is required to get the exact meanings of words and phrases used by the author and to "read between the lines," making inferences from situations presented. Such questions fall into two classes:

a) *Meanings of words and phrases.*—Examples: "What does 'get the blue ribbon' mean?" "What is meant by the statement, 'The blood of the martyrs became the seed of the church'?" "What do people mean when they say that Italy turns her back on the East?"

b) *Inferences from situations presented.*—Examples: "Who tempted the boy to tell a lie?" "What can you learn concerning the cooking arrangements of the Middle Ages from the list of household possessions on page 199 and from the fact that all bread was baked

in one oven?" "What do the Indian relics tell you about the life of the Indians?"

6. *Application of a principle or definition.*—In this type of question the pupil is required to explain existing conditions, or conditions in a new situation, through recognition of the influence of some generalization previously seen in operation, or he is asked to select from a situation examples to show the likeness to the generalized experience. Examples: "Claire's courage and resourcefulness were shown 'in the old days of Indian fighting in the West'; tell of a situation in modern times of peace in which a boy might show the same spirit." "Does the first paragraph fit America only, or could an Englishman say the same thing about his national flag, and a Frenchman of his?" "Is our country a real democracy?" "Tell whether or not southern Norway is a land of the midnight sun."

7. *Selective recall.*—In this type of question the pupil is required to recall facts gained from observation or from other sources to supplement the text. Examples: "What birds come to the trees near your house?" "In what parts of the United States may grizzlies still be found?" "How are the poor cared for today?" "What pictures of Greek buildings and statues have you seen?"

8. *Criticism—forming judgments or opinions.*—In this type of question the pupil is required to criticize the acts of others or to form opinions of others or their acts. Under "criticism" are included judgments as to right and wrong, accuracy, relevancy, consistency, and adequacy. In every case it has been assumed that the author expects the pupil to give reasons. Examples: "What do you think of the evidence given by the author to prove the truthfulness of the last story?" "Was Penn's choice of a capital for his colony wise?" "Did Cromwell do right in having Charles II beheaded?"

9. *Analysis.*—This type of question calls for the breaking up of an idea into parts. Examples: "Point out some of the poet's fancies." "What qualities made Jackson popular with the pioneers of Tennessee?" "What were Cincinnatus' good qualities?"

10. *Interpretation of map symbols.*—This type of question requires the pupil to remember facts selected from the reading and to use them in map reading or in map construction.

a) Map reading.—Examples: "Locate on your map of North

America the scene of Dr. Grenfell's work." "Trace on the map the explorations of Prince Henry, the Navigator." "Look on the map for places named in the French and Indian War."

b) Map construction.—Examples: "Sketch roughly the lands of the Norsemen, also Iceland, Greenland, and northeastern North America." "Make a map showing Roman lands in 133 B.C."

11. *Interpretation of pictures.*—In this type of question the pupil is required to describe pictures or to get the meaning of pictures. Examples: "Find the part of the story that each picture on page 50 illustrates." "Describe the Teutonic village pictured on page 113." "Study the picture on page 238 and find out how a hurling machine works." "After you have read the stories, decide on a good title for each of these pictures."

12. *Selective reading.*—In this type of question the pupil is required to select parts from the whole. The process is one of evaluation—seeing parts in relation to the whole. Examples: "Find the lines which tell that the moon did not know that the wind was blowing." "Find the sentence which tells why bees swarm."

13. *Generalizing as to the central idea of a body of material.*—In this type of question the pupil must recognize the common idea that runs through an organized body of material and formulate a general statement of this central thought. Examples: "What is the lesson we can learn from this story?" "Write an appropriate title for each part." "What is the main point of this story?"

14. *Outlining the main points and supporting details.*—Examples: "Make an outline to guide you in telling the story." "Write out the important points in this story." "After you have read the story, compare it with the outline partly made out and fill in the topics left blank."

15. *Reasoning as to time, distance, or area.*—In this type of question the pupil is required to see relationships as to time or relationships as to distance or area. Examples: "Who of your relatives might have been one of these soldiers—your brother, your father, your grandfather, or your great-grandfather?" "When did the events in the story take place?" "How long has it been from the time of King Hammurabi to the present time?" "Find out how large an area in your locality fifty thousand acres would cover." "About how

long a journey do you think it would be from the eastern edge to the western edge of the region that is shown in this drawing?"

RESULTS OF THE CLASSIFICATION OF STUDY QUESTIONS

Variety of types of questions.—The results of the classification of study questions found in the eighteen texts in reading, history, and geography are shown in Table I. Twenty-nine different types appear; twenty-two of these types appear in each of the three subjects.

Distribution of memory and thought questions in the eighteen texts.—The greatest single demand made of the pupil in the eighteen texts is the demand for memory of material read for the purpose of remembering and restating it. Table I shows that, of the 4,228 questions, 1,637, or 38.7 per cent, are of the memory type, calling for the sheer act of remembering material read for the purpose of restating it orally or in writing. Of the 1,637 questions, 1,200, or 28.4 per cent of the 4,228, are of the type which calls for reading to grasp the organization of a body of material and to remember it for the purpose of reproduction. Ten and three-tenths per cent of all questions are of the type which calls for memory of isolated facts. Since only 9.4 per cent of all questions are of the type of thought question used most frequently, the demand for memory of isolated facts is greater than the demand for any single type of thought.

The emphasis given to memory questions does not appear so great, however, when it is considered in the light of other findings. Since 38.7 per cent of all questions are of the memory type, 61.3 per cent are thought questions of different types. Table I shows that the five most frequently used types of thought questions call for causal reasoning, interpretation of map symbols, comparison, imagination, and reorganization of facts by grouping. These five types combined account for 1,635 questions, approximately the number of the two types of memory questions.

Emphasis given to memory and thought questions in the different subjects.—The six texts in each of the three subjects show the following percentages of memory questions: readers, 36.8; history texts, 49.0; and geography texts, 32.2 (Table II). The readers show the closest agreement with the eighteen texts combined. Twenty-seven and nine-tenths per cent of the questions in the readers call for

TABLE I

DISTRIBUTION OF TYPES OF QUESTIONS BY SUBJECTS

Type of Questions	Reading	History	Geography	Total	Per Cent
Memory:					
Isolated facts	138	75	224	437	.....
Organized body of facts	435	516	249	1,200	.....
Total	573	591	473	1,637	38.7
Causal reasoning:					
Causal reasoning	81	103	116	300	.....
Causal reasoning—analogy	2	15	43	60	.....
Causal reasoning—evaluation	2	21	6	29	.....
Causal reasoning—analogy and evaluation	0	7	0	7	.....
Total	85	146	165	396	9.4
Interpretation of map symbols:					
Map reading	12	37	260	309	.....
Map construction	1	5	14	20	.....
Total	13	42	274	329	7.8
Comparison or contrast:					
Likenesses	15	24	14	53	.....
Differences	13	48	40	101	.....
Likenesses and differences	19	9	46	74	.....
Comparison and evaluation	35	16	34	85	.....
Total	82	97	134	313	7.4
Imagination:					
Reconstructive—verbal	59	73	44	176	.....
Reconstructive—constructive expression	43	17	37	97	.....
Constructive—verbal	18	5	0	23	.....
Constructive—constructive expression	1	3	0	4	.....
Total	121	98	81	300	7.1
Reorganization of facts:					
Grouping	66	36	121	223	.....
Grouping and evaluation	21	37	16	74	.....
Total	87	73	137	297	7.0
Interpretation of author's meaning:					
Words and phrases	67	38	6	111	.....
Inference	109	9	11	129	.....
Total	176	47	17	240	5.7
Application of principle or definition	106	11	52	169	4.0
Selective recall	65	28	63	156	3.7
Criticism	80	21	18	119	2.8
Analysis	32	35	0	67	1.6
Interpretation of pictures	10	7	45	62	1.5
Selective reading	58	0	0	58	1.4
Finding central thought	45	0	0	45	1.0
Reasoning—time, distance, or area	5	8	9	22	0.5
Outlining—central thought and supporting details	18	0	0	18	0.4
Grand total	1,556	1,204	1,468	4,228	100.0

memory of organized facts, and 8.9 per cent call for memory of isolated facts. As would be expected from the nature of the subject, the history texts require the reproduction of facts more often than do the texts of either of the other subjects. They give the greater

TABLE II

PERCENTAGE OF MEMORY AND THOUGHT QUESTIONS INCLUDED IN EACH TEXT

TEXT	MEMORY QUESTIONS			THOUGHT QUESTIONS	
	Isolated Facts	Organized Facts	Total	Type Used Most Frequently	Total
Readers:					
1	4.1	20.3	24.4	13.6	75.6
2	20.0	24.6	44.6	11.3	55.4
3	5.2	32.7	37.9	15.2	62.1
4	5.9	18.4	24.3	17.0	75.7
5	9.1	34.5	43.6	11.5	56.4
6	7.0	42.7	49.7	7.0	50.3
All	8.9	27.9	36.8	11.3	63.2
Histories:					
1	13.4	60.8	74.2	9.1	25.8
2	3.6	63.7	67.3	9.4	32.7
3	3.5	52.4	55.9	19.8	44.1
4	2.3	16.6	18.9	22.8	81.1
5	4.7	2.4	7.1	35.3	92.9
6	1.2	2.9	4.1	27.2	95.9
All	6.2	42.9	49.1	12.1	50.9
Geographies:					
1	1.2	1.6	2.8	23.3	97.2
2	15.9	28.5	44.4	19.2	55.6
3	17.8	11.1	28.9	20.2	71.1
4	7.5	10.8	18.3	19.4	81.7
5	7.3	12.1	19.4	27.2	80.6
6	47.1	40.6	87.7	4.4	12.3
All	15.2	17.0	32.2	18.7	67.8

emphasis, however, to questions calling for memory of organized facts; 42.9 per cent of all questions are of this type, while only 6.2 per cent of the questions call for memory of isolated facts. Although the geography texts show the smallest percentage of memory questions, 32.2 per cent of the total, they include a much greater percentage of questions calling for memory of isolated facts than do the books in either of the other subjects. Fifteen and two-tenths per cent of the questions in the geography texts call for memory of

isolated facts, and 17.0 per cent call for memory of organized material.

The findings by subjects in Table II show that in all three subjects the percentage of thought questions used most frequently exceeds the percentage of questions calling for memory of isolated facts. In the case of the readers, 11.3 per cent of the questions call for interpretation of the author's meaning, while only 8.9 per cent call for memory of isolated facts. In the case of the history texts, 12.1 per cent of the questions call for causal reasoning, while only 6.2 per cent call for memory of isolated facts. In the case of the geography texts, 18.7 per cent of the questions call for interpretation of map symbols, while only 15.2 per cent call for memory of isolated facts.

The variation between subjects with respect to the emphasis given to memory questions is not great. All three subjects use more memory questions than any single type of thought question, and all three give greater emphasis to some type of thought question than to questions requiring memory of isolated facts.

Differences in practice in the use of memory and thought questions in the different texts.—The textbooks vary greatly as to the distribution of memory and thought questions. An examination of Table II reveals a range in memory questions from 2.8 per cent in one text to 87.7 per cent in another text. In three texts more than 60 per cent of the questions are of the memory type. However, in six of the eighteen texts more than 80 per cent of the questions are thought questions, and in ten of the eighteen texts more than 60 per cent of the questions are of the different thought types. While the greatest single demand made of the pupil in these texts is the demand for memory of facts, if we exclude the three texts which give the greatest emphasis to memory questions, the other fifteen texts show a distribution of memory and thought questions which gives opportunity for development of ability in independent use of facts.

TYPES OF THOUGHT QUESTIONS USED MOST FREQUENTLY

Comparison of types of thought questions found most frequently in the different subjects.—While practically all types of thought questions found in the eighteen texts are found in each of the three sets of texts, the types of thought questions used most frequently vary

in the case of the different subjects and in the case of the different texts in a given subject.

Types of thought questions found in the readers.—In the case of the readers, the five most frequently used types of thought questions are, in the order of frequency of use, interpretation of the author's meaning, imagination, application of a principle or definition, reorganization of facts by grouping, and causal reasoning. These five types of questions make up 37 per cent of the questions in the six readers.

No text shows the questions in the order of frequency exhibited by the combined texts. There is closest agreement in the case of questions centering the attention of the pupils on interpretation of the author's meaning; however, two books use this type of question very little as compared with their use of other types. Only one of the six texts uses these same five types of questions most frequently; each of the other five texts places only three of these types of questions among the five types most frequently used. Since the texts disagree so widely, little significance can be placed on the frequency of use of these types of questions.

Types of thought questions in the history texts.—The five most frequently used types of thought questions in the six history texts examined are, in the order of frequency of use, causal reasoning, imagination, comparison or contrast, reorganization of facts by grouping, and interpretation of the author's meaning. Thirty-eight and three-tenths per cent of the questions are of these five types.

The type of question calling for reorganization of facts by grouping is the only type placed among the first five in the order of frequency of use by each of the six texts; the types requiring comparison and causal reasoning are among the first five in the case of five of the six texts; the type requiring interpretation of the author's meaning is among the first five in the case of four texts; the type calling for imagination is among the first five in the case of three of the six texts. These facts indicate a somewhat closer agreement with regard to types of thought questions used most frequently than was shown with regard to the use of memory questions in these same texts.

Types of thought questions in the geography texts.—The five types of thought questions most frequently used in the geography texts

are, in the order of frequency of use, interpretation of map symbols, causal reasoning, reorganization of facts by grouping, comparison or contrast, and imagination. These five types of questions constitute 53.9 per cent of the questions in the geographies. This percentage is much larger than the percentage of memory questions.

There is very close agreement among the geography texts as to the types of thought questions given major emphasis. All the types of questions placed among the first five in frequency of use by the combined texts are placed in the first five by each text except in three cases. One text places the type of questions calling for interpretation of pictures among the first five in frequency of use, and two texts place the type requiring selective recall among the first five.

Summary of the most frequently used thought questions in the three subjects.—The types of questions used most frequently vary in the case of the different subjects. No two subjects place the same type

TABLE III

NUMBER OF TEXTS PLACING EACH OF SEVERAL TYPES OF THOUGHT QUESTIONS AMONG THE FIVE MOST FREQUENTLY USED TYPES

Type of Question	Number of Texts
Causal reasoning	14
Reorganization of facts by grouping	14
Comparison or contrast	13
Imagination	12
Interpretation of author's meaning	9
Interpretation of map symbols	8

of thought question first in the order of frequency of use. There is considerable agreement, however, when the five most frequently used types for each subject are considered. Only three types of thought questions are among the first five in the order of frequency of use in all three subjects. These are the types requiring causal reasoning, reorganization of facts by grouping, and imagination. Questions requiring interpretation of the author's meaning appear among the five most frequently used types in the readers and histories; questions calling for comparison or contrast appear among the first five types in the histories and geographies; questions calling for interpretation of map symbols are placed among the first five

types in the geographies. The agreement in practice with regard to the use of these types of questions can be seen in Table III, which shows the number of texts frequently using these types of questions. Since these types of questions are placed among the five most frequently used types by such a large percentage of the texts, the conclusion may be drawn that their frequent use is not totally accidental; nor is the frequency of use shown in Table I due to overuse of these types by a few texts, as was found in the case of the distribution of memory and thought questions.

CONCLUSIONS

The great variation found in textbook practices suggests that teachers need to analyze the study questions in the texts for their particular grades and to evaluate the findings by comparing them with the accepted objectives of study in the particular fields and with the principles underlying effective methods of study. Such analyses would be valuable both in supplementing the study questions found in the texts in use and in selecting the texts themselves. The great demand for reproduction of material found in the texts, shown by the fact that approximately 40 per cent of all questions are of the memory type, might seem to justify the common criticism that our schools give too much attention to knowledge of facts and too little attention to training children how to think. Since, however, facts accurately learned are essential to correct thinking, textbooks would seem to be justified in the emphasis given to memory questions. Judd places the gathering of "a few simple facts with a certain degree of accuracy" as the first step in the development of ability to reason.[1] Woodrow says that training in ability to reason means giving material with which to think and training in correct methods of procedure.[2] The fact that many memory questions appear does not necessarily mean that the demand is for mechanical memory. The great demand for reproduction of facts is a demand for reproduction of organized facts. If the organization presented in the text is truly comprehended, more than memory of words is involved. Adams,

[1] Charles Hubbard Judd, *Psychology of High-School Subjects*, pp. 458–59. Boston: Ginn & Co., 1915.

[2] Herbert Woodrow, *Brightness and Dullness in Children*, p. 296. Philadelphia: J. B. Lippincott Co., 1919.

speaking of the acquisition of facts as an assimilative process, says that such activity calls for the use of reasoning, not merely memory of verbal symbols.[1] Thorndike points out that reading means thinking as truly as does evaluating, inventing, demonstrating, or verifying.[2] Questions calling for reproduction of organized facts require activity on the part of the pupils which can be performed with accuracy; moreover, the results of such activity can be checked accurately. Pupils doing this type of work may be trained in self-evaluation of the results of their study, an essential habit in the development of effective methods of procedure. The demand made of pupils by questions calling for the reproduction of ideas, however, is a demand which pupils can meet by the mechanical memorizing of words. The great demand for such reproduction of ideas may mean that the pupils will form habits of mechanical memorizing of verbal symbols unless they are guided into more effective methods of study.

The fact that more than 60 per cent of all the questions are thought questions and the fact that fifteen of the eighteen texts give more emphasis to some type of thought question than to memory of isolated facts warrant the conclusion that the tendency in these texts is to train pupils to think rather than to give them knowledge of isolated facts.

Certain types of questions appear so infrequently in all the texts that the conclusion is drawn that no effort has been made to develop the abilities which such questions call into use, or, if the presence of such questions is interpreted to mean an effort to give training in certain mental abilities, the conclusion is that the authors have failed to recognize the law of repetition in the learning process. Certain other types of questions appear frequently in all the texts examined. The fact that certain frequently used types (the first four items in Table III) appear in texts for each of the three subjects and in texts for each of the three intermediate grades would seem to indicate that sufficient opportunity is given for pupils to develop considerable ability in handling such questions in their study by the end of their sixth-grade work.

[1] John Adams, *Making the Most of One's Mind*, pp. 88–89. New York: George H. Doran Co., 1915.

[2] Edward L. Thorndike, "The Understanding of Sentences: A Study of Errors in Reading," *Elementary School Journal*, XVIII (October, 1917), 114.

THE COUNTY-UNIT SYSTEM OF SCHOOL ORGANIZATION

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In connection with the work of our local discussion league on the county-unit system of school administration in Indiana, we decided to conduct an investigation among county superintendents and township trustees of the state. The following questionnaire was sent to the ninety-two county superintendents and to fifty township trustees selected at random.

1. Are you in favor of a county-unit system of school administration for Indiana? (Place an × in the proper square.)

☐Yes
☐No

2. Do you think that the county-unit system would save money for taxpayers?

☐Yes
☐No

Table I summarizes the replies to these questions. Only fifty-five of the ninety-two county superintendents and only twenty-six of the fifty township trustees responded. Some county superintendents stated that they could not give their opinions because their office is political, that they are responsible to the township trustee, and that it would be bad political strategy for them to venture their convictions. Others, prompted by the same motives, simply stated that there were good arguments on both sides of the county-unit question. When the results of this poll were made known to a certain school man in Indiana, he exclaimed, "Trustee-ridden Indiana!" This view may be extreme and perhaps slightly severe. However, the results of the poll indicate a few tendencies worthy of consideration.

The county superintendents displayed more intelligence and discrimination in their answers than did the township trustees. A larger percentage of the county superintendents responded, and many

gave, in addition to their answers to the questions, their reasons for their answers. A few responded with letters giving their arguments for the negative or affirmative. These helped a great deal in determining the general opinion.

TABLE I

SUMMARY OF REPLIES TO QUESTIONNAIRE

	First Question		Second Question	
	County Superintendents	Township Trustees	County Superintendents	Township Trustees
Yes	33*	1	16†	1
No	19‡	23	32†	23
Doubtful	3	2	5	2
Total	55	26	53	26

* Fourteen of these county superintendents qualified their answers with conditions.
† Four of these county superintendents qualified their answers with conditions.
‡ One of these county superintendents qualified his answer with conditions.

As indicated in the tabulated results, only one township trustee voted "Yes." Many of the rest, no doubt, were hampered by politics or lack of understanding. Many a township trustee can see no farther than his own personal interests. When he thinks his office might be abolished, he rises up in protest with an indiscriminate "No." Advocates of the county-unit system make much of the ignorance of township trustees. This contention seems to be confirmed in general by the one-sided vote and in particular by a few heated replies received from trustees. They were angry because we asked their opinion. Of course, their letters were hard to read because of poor English and poor handwriting. One card was returned with the word "RATS" written in large letters over it. These statements, however, must not be interpreted as an indictment of all township trustees. There are many sensible township trustees who would do all in their power to make the schools better. Some would even be in favor of abolishing their office if they were convinced that this would improve conditions. One principal of a small town high school said that he is in favor of the county-unit system generally "but not if all trustees are like the one for whom I work."

Many county superintendents expressed themselves as favoring the county-unit system under certain conditions. They supplemented their votes with "provided it is the right kind," "if modified so as to be sensible," "depends on the statute placing it in operation," "if cities are included," "not in favor of any plan yet submitted," etc.

Most of the county superintendents were doubtful whether money could be saved by the adoption of the county-unit system. Some answers were: "It would cost more." "That is not the question, but efficiency." "Yes, eventually." "Yes, if properly administered." "There is no way to determine." "No, but would secure better results." "Not until transportation facilities are improved." "Yes, after it is organized and in full operation." "Results and not costs are the vital consideration." "An improved school system cannot be had with reduced cost."

Although the vote of the county superintendents and township trustees on the county-unit question is not complete, we get a fair idea of the general opinion among them from the tabulated results. There are ninety-two county superintendents and 1,017 township trustees in Indiana. Since the questions were sent to all the county superintendents and to only fifty trustees, it is reasonable to conclude that, in estimating the general opinion among those in control of rural-school affairs in Indiana, one will find the responses of the county superintendents more reliable than the responses of the township trustees. However, since the vote of the trustees who replied is one-sided, a decided tendency in their opinion is disclosed. The names of the fifty trustees were selected at random from the lists in the *Indiana Public School Directory*.

THE USE OF ASSEMBLIES FOR SOCIALIZING INSTRUCTION

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During the past two years the writer has experimented with the assembly program as a teaching and socializing device in the elementary school. In the junior high school the use of assemblies for socializing and integrating purposes is clearly recognized as essential for the proper social and mental development of the pupils at this age level, but to date little or no use has been made of this powerful device for socializing and integrating the various subjects taught in the elementary school. The writer can see no valid reason for delaying this socializing process until a certain age or grade level is reached. It will be the aim of this article to set forth briefly some of the procedures and conclusions which experimentation seems to uphold.

Assemblies may be divided into two types: instructive and amusing. Experience with the two types both in the elementary school and in the junior high school convinces the writer that, with rare exceptions, the assembly for amusement should not be held during school hours. The work of the school is usually not aided in any way, and the attitude of the pupils plays havoc with the regular work.

In the case of assemblies for amusement a large hall, seating five hundred or more pupils, is essential. For purposes of instruction, however, a smaller room, seating not more than two hundred pupils, is more suitable. The writer has found that from one hundred to one hundred and fifty pupils can profitably attend an assembly program for instruction. All can then hear and see what is going on and can be made definitely responsible for reports on the subject matter presented. If the program is of value for several grade levels, it can be given a second or even a third time.

Among the various types of instructive assemblies, several have been found particularly successful. The assembly may present facts,

introduce or summarize knowledge, present general information, provide training in the duties of citizenship, provide training in the appreciation of the fine arts, furnish vocational and educational guidance, etc. When possible, the programs should integrate and correlate the numerous subjects which the pupil studies in the classroom. Especially is this necessary when the work is departmentalized, as is frequently the case in the upper grammar grades and in the junior high school. The pupil will thus appreciate the single purpose of his apparently unrelated experiences.

The success of the assembly programs in the socializing of instruction will depend on the extent to which the work of the assembly is related to the work of the classroom. In a large school it will be necessary to appoint a teacher who is especially capable to direct and organize the assembly activities. When possible, the principal should do this work himself. It will give him a splendid opportunity to sense the social and intellectual spirit of his school.

In his own building the writer supervises in a general way all the assembly work. The pupils are divided into three groups for assembly programs: (1) the kindergarten and Grades I and II, (2) Grades III and IV, and (3) Grades V–VIII, inclusive. The assembly programs are prepared by teachers within the groups and are primarily for the pupils of the group to which the teacher belongs. The classroom teachers accompany their classes to the assembly. It is relatively easy for the teacher quietly to remind any impatient pupil of his obligation to the actors and to the audience.

Previous to the opening of the second semester of the school year 1925–26, general teachers' meetings were held for the purpose of discussing and outlining the general procedures to be followed. Among other things, it was decided that the program should always begin with the salute to the flag and the pledge, that the program should be limited when possible to thirty or forty minutes, and that the assembly song for the grades in question should be included in the program. The teachers agreed that the work of the assemblies should be correlated with the serious work of the school and that, so far as possible, the pupils should be trained to assist the teachers in preparing and carrying out the programs. Simplicity in the staging of the programs was deemed essential. While the work should be pre-

sented in an attractive and interesting manner, the physical features should not distract the minds of the pupils from the serious work in hand.

The teachers of Group 1 constituted a committee in charge of Group 1 assemblies. Each teacher served in turn as chairman and was responsible for a program. The same scheme was applied to Group 2. In Grades V–VIII the work was departmentalized; hence each subject teacher was responsible for her own program when her turn came. The principal and the chairmen of the committees discussed and at times modified the programs as seemed advisable.

When the programs were being prepared, it was first necessary to determine the abilities which were most sought in the classrooms of a particular group and the extent to which the assembly programs could aid in developing those abilities. These factors having been determined, assembly programs were devised, and the pupils of the group were given opportunities to practice and to compete. The same pupils were not permitted to perform in successive assemblies; nor was the training period of such length that the pupils became tired and disinterested.

It is not possible here to give in detail many of the programs. A few will be given in brief to illustrate the procedure at each group level.

In the case of Group 1 it was agreed that the pupils needed training in speaking clearly and distinctly. The school is located in a foreign neighborhood, and little or no English is spoken in the homes. Many of the children were also shy, especially those in the low first grade. One of the assemblies planned by the pupils in the high first and low second grades featured the dramatization of Mother Goose characters. The characters were represented on the stage by children appropriately costumed. Thus, Little Boy Blue wore a blue coat secured from the engineer for the occasion. Jack carried the pail called for in the selection, etc. As each character appeared, four or five pupils gathered about him and sang a song relating to him. As many different groups of children sang as there were character appearances.

Dramatization in itself is not new. Its value in this case lay in the audience situation, in the fact that each little group of singers

had to co-operate with the actors at the proper time. The little people appreciated more fully why proper enunciation and a good voice are necessary. Finally, the assembly had a real purpose to serve and was not merely a matter of amusement.

Other Group 1 assemblies included story-telling by pupils with the aid of stereopticon slides, training in the rudiments of courtesy, and training in music appreciation. At the close of each program the pupils in the audience were given an opportunity to ask questions, to tell why they enjoyed the program, or, with the aid of the teacher, to decide on the features of the program which they might well imitate in the future. In general, it may be said that the aim of the Group 1 assemblies was to motivate the work of the classroom and to provide the children with situations which would convince them of the need of enunciating clearly, of giving proper attention, and of working together.

The pupils of Groups 2 and 3 are sufficiently advanced to have assemblies which definitely provide instruction or which review and summarize the facts and skills acquired in the classroom.

At times it will be found desirable to have only pupils of the same grade come together. In this case the audience and the actors are of the same grade, and the assembly is a simple grade-subject assembly.

In the grade-subject assemblies the writer finds that contests between the various rooms of the same grade spur the children on to greater efforts. For the contests in spelling, arithmetic, writing, and reading, several children are selected from each room as the result of competition within the room. Care is taken to secure different room representatives for each contest. The extra time devoted to preparing the individual rooms for the assembly is very little, since the contest itself is based entirely on the class work. At the conclusion of the assembly program the pupils in the audience are given an opportunity to ask questions and to criticize. Frequently the teacher or the principal talks briefly on the typical errors made in the arithmetic or spelling contest and suggests methods of avoiding them. A short test based on the program is then given to the audience. The papers are sometimes collected and given to the room teachers, who mark them and discuss them with the pupils later. If

time permits, the papers are exchanged and marked at the time of the assembly. Short one-word answer tests, best-reason tests, and true-false tests are valuable here. They enliven the program, are easily scored, and provide the children with conclusions as to their ability at the time when their interest is most intense.

In the case of the upper grades it is occasionally found desirable to have several grades co-operate in developing an assembly program in connection with one of the subjects taught. Since one teacher, for example, teaches geography in Grades V–VIII, she is thoroughly acquainted with the subject matter, and it is relatively easy for her to select some topic and to show its treatment in the successive grades. In this way the topic of "Sugar" was discussed and handled co-operatively by committees selected from the various grades. The use of slides, maps, and graphs added to the interest of the program. The fifth-grade pupils discussed in their reports the planting and harvesting of sugar cane and sugar beets in North America, the refining processes, and the consumption of sugar. The sixth-grade pupils discussed the same topics in connection with Europe and Asia. The seventh- and eighth-grade pupils presented comparative statistics on the production of sugar in America and Europe and compared climatic and labor conditions. The important points were summarized by one of the pupils. The audience was then given an opportunity to ask questions. A short test followed.

Two distinct types of subject-matter assemblies have been described—simple grade-subject assemblies in which the audience and the actors are on the same educational level and co-operative subject assemblies in which several grades play a part in the same program and the audience consists of several grades. The first is primarily to fix through contests facts and skills essential to the grade. The second provides for greater co-operation and socialization, since pupils of different ages and grades must work together. For many of the pupils much of the subject matter presented is comparatively new. The co-operative assembly becomes in reality a socialized form of teaching as well as a means of correlating the work of the various grades.

Other types of assemblies have proved successful in the upper grades. Works of art, especially paintings, have been presented and

discussed. The life of the artist and the aim and story of the picture usually prove interesting. In this way it is hoped that the pictures in the building will come to have real meaning for the pupils.

The upper grades are organized into room clubs. Once a month these clubs meet at the same hour on the same day. Occasionally several clubs have a joint program. Books of interest may be reviewed or school and civic activities may be discussed, or possibly the talent of individuals may furnish the material for the period.

During the year the city declares a health week, a clean-up week, etc., which furnish subjects for assembly programs. Ordinarily, the writer does not look with favor on outside speakers. Most of them talk over the heads of the children. When a good speaker is available, however, his services are secured. His part in the regular assembly program is to present facts, to instruct. The pupils in attendance are therefore required to submit to their room teachers written outlines or summaries of the speaker's lecture. These may be used in the English class or in connection with some other closely related subject.

The general nature of the assembly work as carried on in one elementary school has been outlined briefly. Some teachers and principals have no doubt been doing similar work for years. Through the assembly meetings a greater and more general spirit of friendly rivalry and freedom can be secured than is possible in the classroom. The pupils, properly directed, can be made aware of their ability to learn from one another. They will understand their social relations better, appreciate the work of the classroom more, and learn how to serve one another and indirectly themselves to greater advantage.

The following statements are conclusions which seem valid and serviceable.

1. To be effective, socialization must be carried on in a systematic manner.

2. If assemblies are used for the socialization of the class work, the programs must be correlated with the work of the classroom.

3. Assemblies for purposes other than instruction should rarely be held during school hours.

4. The assemblies should be so planned that the work of the pupils in the classrooms will take on a new significance and become more vital and serviceable in their daily lives.

5. The socialization of the school work should begin in the kindergarten and continue until the end of the formal school period.

6. For purposes of amusement the assembly hall requires a seating capacity of at least five hundred. For purposes of instruction a smaller room, seating not more than two hundred, is to be preferred. The larger assembly room might be so constructed that sections of it could be readily closed off for group meetings.

7. The instructive assembly may present facts, introduce or summarize knowledge, provide vocational and educational guidance, and provide training in civic matters.

8. Some person interested in assembly activities, preferably the principal of the school, should supervise the assemblies and see that every program has real educational value and serves in some way to socialize a phase of the work in the classroom.

9. The teachers should be organized as committees, each committee to be responsible for the assembly work of a particular grade or group of grades.

10. General procedures as to length of assemblies, items of programs, and other details should be agreed upon at the outset.

11. Simplicity should be the keynote in the staging of the assembly program. The work done and not the mere physical features should arouse and hold the interest of the audience.

12. In order to insure active attention on the part of the pupil audience, some method of follow-up should be used. A test or a summarization by the pupils of the work presented will serve the purpose.

The reader may draw other conclusions as the result of his experience. Every school presents its own peculiar problems. Assemblies of the usual type will no doubt always be valuable in developing school spirit and school unity. The instructive assembly will do this and more. It will correlate the activities of the classroom. It will reveal to each pupil the need of a serious attitude toward his school work. Pupils at the various age and grade levels will learn from one another, a pleasant method of learning. Under these conditions, the pupils will in time include the teacher as one of the group. When this stage is reached, we shall truly have democracy in education.

SOLVING ARITHMETIC PROBLEMS. I

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Training children to solve arithmetic problems is one of the hardest and most discouraging tasks of the teacher. The pupils seem to have a way of doing the wrong thing, of simply juggling the numbers, that is most exasperating. What is the trouble? Are the problems wrong, or are our methods wrong, or both, or neither?

For two years the Committee of Seven[1] of the Superintendents' and Principals' Association of Northern Illinois, with the co-operation of teachers and pupils in a number of schools,[2] attacked the question in a variety of ways. The results of the experiments appear to shed new light on the subject and to offer practical suggestions which will be generally usable.

In general, the method was to set up a hypothesis—a guess as to some factor or factors usually included in problems that might be causing trouble or a guess as to a method that might help children to solve problems. Then we checked this hypothesis through a series of tests given to a large number of children in the middle school grades. Most of the tests were given to children in Grades III, IV, V, VI, and VII. The number of children tested ranged from three hundred to more than a thousand.

[1] The Committee of Seven consisted of the following men: Harry O. Gillet, principal of the University Elementary School, University of Chicago; Floyd Goodier, superintendent of schools, Chicago Heights; Raymond Osborne, principal of the Francis W. Parker School, Chicago, *vice-chairman;* W. C. Reavis, principal of the University High School, University of Chicago; J. R. Skiles, superintendent of schools, District 76, Evanston; H. C. Storm, superintendent of schools, Batavia, *secretary;* Carleton W. Washburne, superintendent of schools, Winnetka, *chairman.*

[2] The schools co-operating in controlled experiments were the Francis W. Parker School (Chicago) and schools in the public-school systems of the following Illinois cities: Chicago Heights, Evanston, Batavia, Winnetka (three schools), Western Springs (two schools), Desplaines, Dundee, Brookfield (two grades), Dolton (two grades), Wilmette, LaGrange, Elgin (three schools), Lyons, and Sterling.

Unfortunately, there is not enough space available to give the details of each experiment. In this article we can describe the experiments only briefly and give the general outcome of each.

1. *Is inability to visualize the situation dealt with in the problem an important cause of failure to solve the problem?*

We attempted to answer this question only for comparatively simple one-step problems. The procedure consisted of giving the children such a question as the following as the first problem in a test: "Mary wished to buy a gift for her sister. She went to the toy store to buy a doll." Then followed four pictures. In one, Mary was standing at the counter of a fruit store; in another, she was in a drygoods store; in a third, in a candy store; and in still another, in a toy store. The children were to underline the picture that told about the problem.

This type of question was repeated in a variety of forms and in two different series of tests. The results showed that practically all the children answered the questions correctly. Apparently, the children did not encounter in simple one-step problems the reading difficulties which are commonly supposed to hamper pupils in visualizing the situations involved.

2. Many teachers require their pupils to state (or think), before solving a problem, what elements are given, what ones are to be found, what extraneous elements, if any, are to be disregarded, what process is to be used, and what the approximate result will be. *Is there any relation between ability to solve problems and ability to make some such formal analysis?*

A great deal of the time and energy of the committee was spent on this question. Tests were prepared, given, analyzed, revised, regiven, and re-analyzed repeatedly. We tried one-step problems and two-step problems, problems involving various combinations of processes, and problems suited to the earlier grades and to the later grades, and we analyzed the results in various ways. The results were directly contrary to what we expected; so we checked and rechecked.

The following is a typical test of this series.

1. Joe, George, and Tom were going on a picnic. For their lunch they paid 9 cents for a loaf of bread, 36 cents for boiled ham, 15 cents for butter, 24 cents

for cheese, and 12 cents for olives. How much should each boy have paid as his share of the cost?

Work the problem in this space and mark your answer plainly.

[Space]

2. Joe and his playmates were going on a picnic. For their lunch they bought bread, butter, cheese, ham, and olives. Draw lines under the two facts below that you must know before you can find each boy's share of the cost.

Where they went for the picnic.

How old the boys were.

How much each kind of food cost.

At what store they bought the food.

How many boys went on the picnic.

3. Joe, George, and Tom were going on a picnic. For their lunch they paid 9 cents for bread, 36 cents for ham, 15 cents for butter, 24 cents for cheese, and 12 cents for olives. Draw a line under each fact that you know already from reading the problem:

How much they paid for cheese.

How many boys went on the picnic.

How many pounds of ham they bought.

How much they paid for bread.

How much they paid for butter.

What kind of cheese they bought.

How much they paid for olives.

How much they paid for ham.

4. Joe and his two friends, George and Tom, went on a picnic. For their lunch they paid 9 cents for bread, 36 cents for boiled ham, 15 cents for butter, 24 cents for cheese, and 12 cents for olives. There are two things which this problem does not tell you but which you can figure out. Draw a line under both of them.

How much their luncheon cost.

How much cheese they bought.

How old the boys were.

How much each paid as his share.

How long they were gone.

5. Joe and his two friends went on a picnic. For their lunch they paid 9 cents for bread, 36 cents for ham, 15 cents for butter, 24 cents for cheese, and 12 cents for olives. The ham was 90 cents a pound and the cheese 30 cents a pound. How much should each boy have paid as his share of the cost? In the list of numbers below draw a line under the two you do not need in solving this problem.

90 cents	30 cents
36 cents	9 cents
15 cents	12 cents
24 cents	

6. A week later the three boys went on another picnic. This time for their lunch they paid 18 cents for rolls, 26 cents for sausage, 15 cents for butter, 34 cents for cakes, and 12 cents for pickles. Do not figure out exactly each boy's share of the cost, but guess as closely as you can which of the numbers below is nearest right. Draw a line under this number.

5 cents	35 cents	$1.00
15 cents	50 cents	$2.00

7. To find the exact answer you do two of the following things. Draw a line under each.

Add	Multiply
Subtract	Divide

An analysis of all the tests in all the grades showed that in every case there was little or no relation between ability to solve the problem and ability to take any of the other steps. The children analyzed a problem correctly and solved it incorrectly or solved it correctly and analyzed it incorrectly just as often, or almost as often, as they *both* solved and analyzed it either correctly or incorrectly.

There was some relation, but very little, between ability to solve the problem and ability to answer Question 2—what a person needed to know before he could solve the problem. There was also a slight relation between ability to solve the problem and ability to tell the processes that should be used in solving it (Question 7). Even in these two cases there was no relation almost as often as there was some relation.

We were forced to the conclusion that *ability to make the type of formal analysis frequently taught in school has practically no relation to ability to solve problems.*

It was possible, however, that the lack of relation between ability to make formal analysis and ability to solve problems was due to inadequate training in making formal analysis. We therefore organized several parallel-group experiments in different grades. For a period of two weeks one group was taught how to analyze problems, being given careful training in the various steps of formal analysis. The other group spent the same amount of time simply solving problems with no special technique. When the pupils were retested at the end of two weeks with a problem-solving test very similar to that on the basis of which the groups had been paired, those who had not been taught formal analysis did as well as those who had been trained in such analysis—in many cases, better.

This result was so contradictory to our preconceived ideas that we sought to explain it on the ground that the training period may have been too short, that the groups may not have been of equal ability, or that the technique may have been faulty in some respect. We therefore decided to repeat this phase of the experiment the following year, devoting our whole time and effort to a thoroughgoing attempt to determine whether definite training in formal analysis is helpful in teaching children to solve arithmetic problems. The results of the second attempt will be reported in Part II of this article.

3. *To what extent is unfamiliarity with the situation involved in the problem, or with the materials with which the problem deals, a cause of failure to solve the problem correctly?*

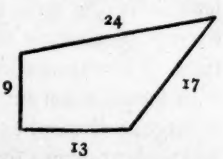
This question was studied in the following manner. Tests were devised with pairs of problems of the same mathematical difficulty, one of each pair dealing with a less familiar situation or with less familiar materials than the other. The following is an example of this series of tests.

Directions.—Work the problems as quickly and as accurately as you can. Do all the work in the space after each question. Mark your answers plainly. If you cannot do a problem, pass on to the next without wasting time. Go back and try again if time permits.

A 1. Three bars of chocolate sell for 10 cents. How many bars can I buy for 40 cents?

E 2. A kilometer is equal to about 0.62 miles. The distance between two towns in France is 38 kilometers. How many miles apart are they?

B 3. A farmer bought a new wire fence for his field. The shape of the field is shown in the following drawing, with the length of each side in rods marked. The fencing cost $5 a rod. What did the whole fence cost?



C 4. The gauge on my gasoline tank registered 4 gallons, and I bought 10 gallons more. After driving 192 miles, I ran out of gasoline. How many miles to the gallon of gasoline did my car travel?

D 5. 100 grams of fresh oak leaves were dried and found to weigh 39 grams. 100 grams of maple leaves, treated in the same manner, weighed 47 grams. Which kind of leaves contained the more water and how much more than the other?

A 6. In France two liters of petrol cost 9 francs. How many liters of petrol can be bought for 90 francs?

D 7. George and Tom were each given 90 cents for spending money. After George went to a "movie," he had 46 cents left. Tom bought some candy and a new ball and had 29 cents left. Which boy spent the more money, and how much more did he spend?

C 8. A chemist dissolved 180 grams of potassium nitrate in 8 liters of water and then added 4 more liters of water. How many grams of potassium nitrate are there in each liter of this solution?

E 9. How much will 36 yards of cloth cost at $0.65 a yard?

B 10. The members of the dramatic club of the high school voted to tax themselves $3 each to buy a new curtain for the stage. In the club there are 18 Seniors, 15 Juniors, 9 Sophomores, and 26 Freshmen. How much money can they raise?

Notice that Problem 6 corresponds to Problem 1, Problem 9 to Problem 2, etc., as indicated by the key letters. The key letters did not, of course, appear in the actual test.

TABLE I

	Number of Problems Solved Correctly						Percentage of Problems Solved Correctly	Difference in Percentages
	A	B	C	D	E	Total		
School 1:								
More familiar situations....	64	62	64	65	69	324	74	14
Less familiar situations.....	46	61	42	54	60	263	60	
School 2:								
More familiar situations....	24	20	24	24	22	114	87	12
Less familiar situations.....	17	22	23	13	23	98	75	

The results of giving this test in two different schools are shown in Table I. In a similar test the average percentage score on problems involving more familiar situations was only 7 higher than the average percentage score on problems involving less familiar situations. These results indicate that, while the element of unfamiliarity with the situation enters in as a difficulty in problem-solving, it is not as large an element as might be supposed. Furthermore, well-chosen textbook problems for class work contain very few such unfamiliar situations as are presented in some of the problems in the tests.

4. *Do pupils who can manipulate numbers correctly in the processes involved and who can solve problems when the numerical work is simple enough to be done mentally fail to carry over these abilities in working similar problems which require pencil and paper?*

For example, if a child can divide 132 by 3 on paper and can solve a short-division problem like No. 7 in the following test, involving the use of very easy numbers, divisible mentally, can that child solve a short-division problem like No. 4 in the test, involving the use of the written process? For the purpose of answering this question, a test was devised made up of three sets of problems, each set involving (1) the written process alone, (2) a problem simple enough to be done mentally, and (3) a similar problem with numbers large enough to require the written process. The sets covered subtraction, multiplication, and division and were, of course, given in a mixed order, as the following sample test shows.

GRADES III, IV, AND V

Do all your work on this paper.

1. *Subtract:*	2. *Divide:*	3. *Multiply:*
124	3)132	14
−36		×7

4. Four children decided to put all their pennies in a box for a month and then to share them evenly. When they counted the pennies, there were 144. How many did each child get? Answer_____
5. A girl bought 3 ice-cream cones at 6 cents each. How much did they cost her? Answer_____
6. A boy had 114 marbles. He lost 27. How many did he have left? Answer_____
7. There were three children in a family. Their mother put her pennies in a box for them all week; then she told them that they might open the box and share the pennies. There were 12 pennies in the box. How many did each child get? Answer_____
8. A girl bought 6 yards of ribbon at 16 cents a yard. How much did it cost her? Answer_____
9. A boy had 14 marbles. He lost 6. How many did he have left? Answer_____

A similar test, including more difficult numbers, was given to Grades V, VI, and VII. Table II shows the percentage of pupils in four school systems who failed to carry over the ability to handle the written process alone and to do the problem in simple form to the solving of a problem requiring the written process. The tests were scored both on the basis of the processes chosen, mechanical errors being ignored, and on the basis of the answers.

These results indicate that pupils' inability to carry over a process they know to a problem requiring written work is a frequent cause of difficulty, even when the pupils can do a similar problem involving small numbers. This difficulty is most evident in the lower grades, where the processes have just been learned, and tends to disappear as the processes become more fully automatic.

TABLE II

	Percentage of Pupils Failing To Use Correct Process			Percentage of Pupils Failing To Obtain Correct Answer		
	Subtraction	Division	Multiplication	Subtraction	Division	Multiplication
Grade III	20	30	39	41	60	66
Grade IV	8	25	16	22	32	25
Grade V:						
Easier test	2	1	5	20	11	12
Harder test	5	16	8	34	32	20
Grade VI	0	9	0	0	15	12

5. *Is lack of facility in the accurate use of arithmetic mechanics a common source of error?*

A study of the errors involved in the tests just described and in a similar test given in a different school shows that most of the errors were mechanical and that such errors are as likely to occur in working examples as in solving problems.

[*To be concluded*]

Educational Writings

REVIEWS AND BOOK NOTES

An introductory textbook in education.—To the already large group of books which purport to introduce students to the field of education has been added one written by John Louis Horn.[1] The content of the book has been built up from the experiences of the author in giving an introductory course in education in Mills College.

The book is divided into three sections. Part I, consisting of nine chapters, discusses "Education: The Institution"; Part II, consisting of four chapters, deals with "Education: The Process"; Part III, consisting of two chapters, is devoted to "Education: The Practice." The book is written primarily from a historical and philosophical point of view.

The student is introduced to the field of education by two chapters dealing with educational theory, which are followed by a chapter on the history of the high school and a chapter on the history of the elementary school. The chapter on the high school begins with the Renaissance in Europe; that on the elementary school, with the Protestant Reformation. Only three pages are devoted to the important developments in the American high school since 1821, in contrast with twenty-two pages devoted to the period prior to 1821. Other chapters in Part I deal with the junior high school, the junior college, how education is organized and how it might be organized, and the relation of the state to education.

The most stimulating chapter in Part I is that dealing with the possible organization of education. Here the author reiterates his criticism of small-unit organization and its effect on the efficiency of the schools.

> The time has come to call attention to the fact that in America every change of post means a change of job. Generally speaking, teachers are not promoted from position to position. They seek to better themselves by resigning in one place and applying elsewhere. Except in very large units, such as the cities represent, and except for people who desire to stay within these units, a teacher must always carry about with him his bundle of credentials, and impress prospective new employers with his desirability. He does not advance by promotion; his career is not continuous [p. 194].
>
> A well-organized system of state schools would offer a number of parallel careers of comparatively equal importance. It would be possible to enter a field, or to change

[1] John Louis Horn, *The American Public School*. New York: Century Co., 1926. Pp. xx+404. $2.00.

from field to field, early in one's career in public education. It would be possible for supervising authorities to carry a teacher from the least responsibility to ever increasing responsibility in his own field; from teaching an ungraded school in an isolated district to the responsibility of a headship in one field of instruction in a large city; or to promote a principal of a five- or six-teacher school continuously until he becomes the superintendent of schools in an important city [pp. 196–97].

Part II devotes two chapters to an interesting discussion of the adjustment of school procedures to different types of pupils in a democratic school system. The author's position here reflects mature thinking, and his treatment is worth careful study. There follows a chapter on the curriculum, which is not so well done. It fails to make the reader aware of the significant experiments now being conducted in this field. The last chapter in Part II presents "The Scientific Method in Education" in a manner which is certain to be adversely criticized by those who have received their professional training in institutions which emphasize the scientific method of studying education. Professor Horn devotes a considerable proportion of the chapter to proving that there can be no science of education but only the application of scientific methods to the problems of education. His position is nebulous, and the entire matter, which is chiefly one of definition, is scarcely worth the consideration devoted to it. Emphasis is placed on the limitations of the scientific method in dealing with educational problems. "No amount of scientific procedure," he says, "will help to determine whether we should establish a caste or a democratic system of education" (p. 333). To whom would Professor Horn turn for an answer to the question? Certainly, the speculations of an a priori philosophy have not proved convincing. The reviewer holds a view directly opposite to that of Professor Horn, namely, that the most convincing answer would come from a careful scientific evaluation of the objective results of the two systems of education. The reviewer would further criticize the chapter in question on the ground that it does not present a true picture of the scientific movement in education. The "list of achievements" cited at the bottom of page 336 is not representative of the fundamental scientific research which has been carried on, and the emphasis given to measurements shows a confusion of the concepts of educational service and educational research.

Part III is brief, devoting one of its chapters to a concrete presentation of the work of the schools in Detroit and the other to a life-career in education.

In certain matters of detail the book lacks careful editing. For example, the reader will be somewhat surprised to find that the name of the general editor appears as "Dean Chassey" (p. ix); likewise, he will not be satisfied with "the country unit" (p. xvii) for "the 'county' unit," nor with such expressions as "There is one group who feel" (p. xi), "the older group . . . . do not care" (p. 15), and "There are . . . . a certain proportion of" (p. 15).

Considering the book as an introductory text, the reviewer thinks that its principal shortcoming is the lack of concrete facts relating to public schools in America. In his judgment, a beginning student is better prepared for the problems of educational theory after he has become thoroughly familiar with a large

body of concrete material. The author obviously holds a different view. It is altogether desirable that various plans be tried and that the results of experience be allowed to show which of the several methods of introducing students to education will be conducive to the best results. Professor Horn's book deserves careful reading by instructors in education. There is much in it which will be provocative of thinking among students.

G. T. BUSWELL

The maladjusted child.—The past decade has seen a rapid accumulation of studies of the social maladjustments of children. To these the work[1] of Burt is a welcome addition. The material of the volume, comprising six hundred pages, has grown out of his work as psychologist in the education department of the London county council; its form, out of a course of lectures to London teachers. Except for a few reservations, one hopes that it may be read by all teachers, especially those who still retain what may be termed the "moralistic" attitude toward the ineffective shortcomings of the child's experiments in living in a world which is organized, at best, with but scant consideration for his needs and welfare.

The book contains fourteen chapters devoted to the causative factors and the general psychology underlying the actions of delinquents as deduced from an intensive study of two hundred delinquent cases and from observation of each case over a period of not less than three years. A number of admirable phases characterize the work. First of these is the use of a control group of non-delinquents of equal number, taken from the same schools and environments and otherwise of approximately like quality and studied with equal intensity. Various statistical tables of the comparative incidence of causative factors affecting the two groups show well-marked differences. Throughout the discussion emphasis on the subtlety and complexity of causative factors is maintained, with none of the superficiality of thought and experience which impelled writers of a previous day to reduce crime to one or a few outwardly observable factors. Comparison of the author's work with other special and general studies of delinquency, poverty, etc., is noted throughout. There is much clear discussion of the general underlying psychology of the effect of causative factors in conjunction with the factors of individual physical, mental, emotional, and temperamental quality which condition reaction to them. There is a discussion of the remedial treatment of each phase or set of conjunctive factors. The author suggests that the school should assume a position of responsibility toward the problem. He has not, however, included a discussion of the basic conditions of this responsibility except as may be hinted at in the statement that, due to the varied curriculums of the modern school, hatred of school and truancy have markedly declined. There are clear and well-presented case studies illustrating the influence of major and minor factors of causation.

[1] Cyril Burt, *The Young Delinquent.* New York: D. Appleton & Co., 1925. Pp. xvi+620. $5.00.

Chapter i is devoted to a discussion of heredity as a factor in child delinquency, a type of discussion which is rendered more necessary, possibly, in an English work than in an American publication because of the persistence of the legal category of the "moral imbecile" with its implications of inborn criminal quality. A comparison of the incidence of a number of supposedly inheritable conditions conducive to crime in the case of the delinquent and non-delinquent groups produces a correlation of .41 between juvenile delinquency and delinquency of other members of the family and an average of .29 for all inheritable conditions combined. The author argues, however, that delinquency is due not to inheritance but to the unfavorable moral influences set up in the home by the delinquent or unstable parents and that criminal heredity is not to be assumed from the few striking histories of criminal fraternities that have been reported.

Two chapters are devoted to environmental conditions within and without the home. Those within the home include poverty and its concomitants, defective family relationships, defective discipline, and vice. Using as a basis the census of delinquency for the whole of the various boroughs of London compared with the percentage of poverty of those areas, the author finds the correlation between delinquency and poverty to be .67. The effect of relative poverty is shown to be as definable as the effect of absolute poverty. A child from a home of reasonable material comforts who is thrown with children of greater wealth is highly susceptible to temptation. However, the author shows that it is not the fact of poverty in itself which is the most influential factor but the concomitants of poverty, such as overcrowding in the home and the absence of home and neighborhood recreational facilities. By far the greatest influences are attributed to defective family relationships (.33), defective discipline (.55), vicious home (.39), and environmental conditions outside the home (.29). The conditions outside the home comprise the factors of influence exerted by delinquent companions, excessive and deficient local facilities for amusement, uncongeniality of employment or lack of employment, and uncongeniality of school.

Physical conditions, developmental and pathological, show correlations of .37 and .15, respectively. The underdeveloped, the overdeveloped, and those hampered by the persisting defects of disease are stimulated to unfavorable social reactions.

Two chapters are devoted to the intellectual conditions of delinquents. Of the entire group, 82 per cent are below average ability. Twenty-eight per cent are technically dull and 8 per cent are definitely defective, as compared with 9.7 per cent technically dull and 1.2 per cent definitely defective in the control group. Dullness and deficiency constitute negative rather than positive factors in delinquency except in cases of emotional instability. The incidence of superior intelligence is 2.5 for the delinquent and 8.5 for the non-delinquent. The superior child reacts rebelliously or with superior cunning in exploitation for the satisfaction of wants not met by the home or the school, or with emotional conflicts in attempts to adjust unfavorable environmental conditions. In the chapter entitled, "Sentiments and Complexes," the mode of development of these emo-

tional conflicts is simply and clearly presented. It is to be noted that barely 2 per cent of the delinquents were found definitely pyschopathic in mental quality.

It is in connection with the chapters dealing with instincts and emotions that the author has entered debatable ground and has proposed a theory of delinquency which stands as a contradiction of his otherwise well-assumed attitudes. He accepts fully the McDougall psychology of this subject and maintains that, in spite of all the unfavorable conditions surrounding delinquency, it is finally due to qualities of temperament which are individually unique and that differences in the strength of instincts in different individuals condition their reactions to the factors set up by the environment. It is significant, however, that in the analyses of cases throughout the book and in the reports of the treatment by which cure was effected he has not needed to resort to instinct in explanation except in a few cases of sex offenses. He has made his presentation wholly in the light of environmental and other observable conditions, and he has explained the cures on the same basis. It is regrettable that a good presentation has been weakened by resort to an unprovable theory. The author himself contradicts his theory by the statement that he has discovered 170 distinct conditions conducive to crime; no one would maintain that there are 170 instincts. In the opinion of the reviewer, the book would be improved by the deletion of these chapters.

The discussion of treatment appended to each type of delinquent complex is complicated somewhat by the attempt to bridge existing archaic defects in English law and to develop possibilities to a set of ideal conditions. One such instance is to be noted in connection with the practice of birching boys permitted under the supervision of the court. After presenting such conclusive arguments against it as would lead to its total elimination, the author concludes that it is desirable in some cases.

The advisability of including photographs of cases is questionable even though safeguards against recognition are maintained. They do not contribute to a clearer comprehension of the material presented.

CLARA SCHMITT

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The use of research as a basis for directing pupils' reading activities.—The last half-century has witnessed the amassing of a vast store of researches in school subjects. So great is this store that the unguided general practitioner can hardly hope to acquaint himself with all researches or even with those which are most significant for a given department. As research workers have been especially generous in their attention to the subject of reading, guidebooks which direct practitioners to significant discoveries in this field and supply interpretations of them are requisite for the modern teacher and supervisor of this subject.

From the results of investigations of the psychology of reading, Professor Brooks has winnowed the portions which seem most significant to him.[1] His treatise is designed for use by the great variety of teachers in service and by prospective teachers in training. Dr. Brooks is to be commended for performing his difficult task in a fairly comprehsenive and very practical fashion.

The book opens with two introductory chapters which present important psychological problems of reading. These chapters are followed by six chapters which treat such aspects of reading as visual conditions in both oral and silent reading; the interpretation of words, sentences, and paragraphs; and the cultivation of literary appreciation. Two chapters deal with the measurement of achievement in reading. Six chapters direct the reading of children who are making either normal or slow progress in reading. The psychological problems presented in the introductory chapters include those which arise from the inadequacy of materials of reading and from the ineffectiveness of teachers as well as those which arise from children's unfitness to react favorably to certain educative stimuli. The author finds, therefore, that failure to select materials which are adapted to the equipment, interests, and needs of pupils has led to overemphasis on the "husks of learning" and to a consequent failure to utilize the content of a broad range of well-selected materials. He finds also that incompetent as well as competent persons attain teaching positions and that many of them know neither how to select, organize, and present reading materials nor how to direct pupils to make the best of ill-adapted material. Finally, since intelligence is a prerequisite for successful reading and since the intelligence of pupils is uneven, both qualitatively and quantitatively, Dr. Brooks finds pupil conditions which demand a psychological analysis of the whole reading situation. By setting forth these problems in the preliminary analysis, the author motivates and orients the reader for the subsequent discussions of the nature and the processes of reading, the measurement of reading ability, and the directing of pupils' reading activities.

Because of the summaries and interpretations of investigations and the practical applications of the results of investigations, the book will be a time-saver to the experienced student of reading and a helpful, informing guide to the immature student. Valuable questions for discussion follow each chapter, and a carefully selected bibliography is provided at the end of the book.

WILLIS L. UHL

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An investigation of pupils' methods of work in arithmetic.—The writer of this review wishes to say, first of all, that the monograph entitled, *Diagnostic Studies*

[1] Fowler D. Brooks, *The Applied Psychology of Reading, with Exercises and Directions for Improving Silent and Oral Reading*. New York: D. Appleton & Co., 1926. Pp. xviii+278.

in Arithmetic,[1] is the best thing of its kind that has yet appeared. Every teacher and supervisor of arithmetic should get a copy at once.

The authors present an introductory chapter showing the need of diagnosis in arithmetic. When children who are asked to respond to 58−4 put down fifty-eight marks, cross out four of these marks, count the remainder, and get 55, the teacher and the supervisor ought to be aware of the situation. To teach without the facts in such a case is to teach blindly.

Blind teaching is to be avoided, but one phase of blind teaching is often overlooked. The longer and the harder the teacher works, the less competent are the pupils. Practice in bad habits is an ever increasing liability. It would be much better to abandon arithmetic altogether. Such pernicious waste of time is no longer excusable because the authors of this monograph have shown the way of escape.

The authors have used a study of eye-movements in column addition, time analysis, and detailed diagnosis as methods of attack. Their results show how the eyes should move when an individual is adding a column of figures and how very differently the eyes of some children move. Valuable information is given concerning the combinations which require much time for learning and concerning those which require little time.

The authors point out that the best way in which to find out what children need is to take them one at a time and ask them to "think aloud" as they solve their exercises. This does not mean that every pupil should be so studied. The method is to be used only in the case of the three or four pupils in the class who are having the greatest difficulty. These are the pupils who exhaust the teacher and waste the time of the whole class.

The monograph contains a diagnostic chart and explains very carefully the details of its use. Tables showing the nature and the frequency of 142 bad habits in the fundamental processes are given. The last two chapters are devoted to suggestions for remedial treatment and to the teaching of arithmetic.

In spite of the wealth of valuable conclusions afforded by the summaries at various places in the monograph, the authors have been very cautious in the interpretation of their data. In view of the scarcity of material of this sort, they should have been more bold in their conclusions. For example, they present the time reactions of from nine to fifteen subjects in the case of each of fifty combinations involved in column addition. Of these fifty combinations, sixteen are of the first decade; twenty-nine are from higher decades; and five result from the carrying of an unseen figure. The first-decade combinations require an average of 151.3 fifths of a second; the higher-decade combinations, 174.8 fifths of a second; and the combinations involved in carrying, 246.8 fifths of a second. The twenty-four combinations which do not involve bridging require an average

[1] G. T. Buswell, with the co-operation of Lenore John, *Diagnostic Studies in Arithmetic*. Supplementary Educational Monographs, No. 30. Chicago: Department of Education, University of Chicago, 1926. Pp. xiv+212. $1.50.

of 122.2 fifths of a second, while the twenty-one that involve bridging require an average of 217.1 fifths of a second. There are twenty-seven combinations in which a number in the units' place is added to a smaller number just above it. The average time required for these combinations is 153.2 fifths of a second; for the reverse type, 183.7 fifths of a second. If we assume that longer time means greater difficulty, the conclusions that could have been drawn are obvious. Similar conclusions are also possible from similar data in the other three fundamental processes.

The tables giving the nature and the frequency of the bad habits discovered lack "punch" from a publicity point of view. The percentages are not given. For this reason, the casual reader will not see that, if we can remove the six worst habits in addition, 49 per cent of the whole trouble will be removed. The corresponding figures in the other processes are: subtraction, 62 per cent; multiplication, 42.5 per cent; division, 41 per cent.

There are those who will not agree with the authors' statement that the "construction of remedial methods obviously is not a task for the psychologist to work out in the laboratory." They will say that the construction of such methods involves such questions as the order and the difficulty of habit formation in specific cases and will be loath to let the psychologist off so easily.

None of this is at all derogatory to the splendid character of the contribution which the authors have made, and all competent persons who read the book will agree with the statement with which this review opened.

W. J. OSBURN

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A unit plan in practice-teaching.—The problem of administering and supervising student teaching has become very complex. On the one hand, in many teacher-training institutions, even where the laboratory schools are large enough to accommodate all the student teachers enrolled, the novice is placed in charge of a classroom situation without adequate preparation. On the other hand, the larger teachers' colleges and universities are unable to provide even an indifferent kind of practice-teaching for all the students who are preparing to teach. Cases may be cited in which teacher-training institutions enrol as many as one thousand students and have practice-teaching facilities for considerably less than one-half that number. No satisfactory solution of the second difficulty seems to have been offered to date. Possibly some plan which does not include student teaching will have to be evolved.

The first difficulty mentioned in the preceding paragraph is given consideration in a recent publication.[1] The author points out that too frequently the student is almost hopelessly confused by being placed in a complex teaching

[1] Hugh Clark Pryor, *Graded Units in Student-Teaching*. Teachers College Contributions to Education, No. 202. New York: Teachers College, Columbia University, 1926. Pp. vi+114. $1.50.

situation without sufficient knowledge of classroom procedure. A series of twenty-one graded units is suggested as a means of introducing the student teacher, by steps of increasing difficulty, to the science and the art of teaching. The book includes an extended discussion of the development and the use of the graded units in a teachers' college with the co-operation of student teachers, critic teachers, supervisors, members of the National Association of Supervisors of Student-Teaching, and others. The list of units begins with the relatively mechanical matters of "Cleanliness and Neatness of the Room" and "Lighting, Heating, and Ventilation" and ends with the complex problems of "Securing Parental Co-operation," "School Discipline," and "Securing a Position and Holding It." The author suggests that the units may serve as cores around which to organize different professional courses, such as school management, psychology, and physical education. He believes that this breaking down of the lines between the various subjects and the reorganization of the material into large units will produce better teachers. In meeting a criticism of the graded units, the author says, "Those who use graded units find that it is no more difficult for the student-teacher to reintegrate them into the whole teaching task than for the student of law or medicine to unify what he has learned through the study of many cases in law or medicine in the practice of his profession" (p. 101).

The Appendix includes a list of the graded units and complete outlines of three selected units. The outlines include appropriate problems, projects, and references for the benefit of the student teacher.

The study has limitations in that it is empirical and based on personal opinion. It would be very much worth while to know in mathematical terms whether better teachers are produced by using the graded-unit plan. The parallel-group procedure could be followed in such an experimental study. The author admits that the plan is more expensive than one in which the student teacher has a greater amount of responsibility in the classroom but suggests that "those who are engaged in the training of teachers should not be deterred by arguments regarding cost so long as it is less than for the training of scientific farmers, members of other professions, or liberal-arts students in colleges and universities and so long as our bill for luxuries so far exceeds that for education" (p. 102). It would seem more logical to defend the greater cost of the plan in terms of the increased teaching efficiency of the students in training.

The book deals with one of the most important problems in teacher-training institutions. It is hoped that the conclusions enumerated will be verified experimentally and stated in quantitative terms in further investigations. Even the graded-unit plan does not solve the problem of the large institution which has practice-teaching facilities for only a small part of the students in training. The investigator who devises a workable and effective scheme for training teachers that does not involve practice-teaching will solve a pressing problem of the large teachers' college.

CARTER V. GOOD

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Using tests for classification.—The application of the results of research and the use of the materials that research has provided constitute one of the major problems of the school administrator. In the last ten years perhaps no other field has benefited from research as much as have mental and educational tests. Such tests have been regarded as a possible means of the solution of the problem of pupil classification. Hobart M. Corning, superintendent of schools, Trinidad, Colorado, has made available for other workers what his school has done in this field.[1]

After briefly reviewing the testing movement, Mr. Corning reports in some detail the work carried on in the Trinidad schools. First, a group intelligence test was given to all the pupils, and the distribution of the scores was studied. This distribution was no different from that generally found, but it moved the school system to study the problem of what could be done to meet the situation revealed.

It was decided to reclassify all pupils under a new plan, one based on capacity for learning rather than merely on the rate of learning, which the author thinks to be the basis of the various systems that he reviews. The basis of division that seems to the author to meet the criteria of capacity is a combination of mental age and I.Q. Multiple-track curriculums were developed for the different groups by experimenting with the amount of material that each group was able to handle profitably. This reorganization into multiple-track curriculums was undertaken from the point of view of teaching and administration and was not an attempt at a fundamental derivation of curriculum material.

After the reclassification was made, educational tests were given. The results are offered as evidence that the plan of classification was sound. Certain practical problems are treated, such as the reception given the plan of classification by the parents, the reaction of the teachers, and the redistricting of the schools so as to provide several sections of each grade in one building.

Superintendent Corning has produced a book that shows how to blend the theoretical and the scientific with the practical. It is possible to criticize certain points in his work, but the author himself realizes that he has not said the last word. The spirit of the book is such that it should be an incentive to other superintendents to carry on similar experimentation in their school systems.

RALPH M. HOGAN

A criticism of certain interpretations of test evidence.—The relative significance of conclusions drawn from facts depends in no small degree on the bias and the point of view of the individual who arrived at the conclusions. In fact, scientific workers postulate that data are not complete unless the point of view of the observer is presented as part of the evidence. The influence of bias on interpretation is illustrated in the varicolored conclusions which have been drawn from the results of the intelligence tests, particularly those given in the

[1] Hobart M. Corning, *After Testing—What?* Chicago: Scott, Foresman & Co., 1926. Pp. x+214. $1.60.

United States army at the time of the world-war. One of the first shots to be fired in the battle over the interpretation of the data derived from the army tests was that of W. C. Bagley in the paper, "Democracy and the I.Q.," which he presented before the Society of College Teachers of Education in February, 1922. Later, while the verbal and statistical war was at white heat, article after article flowed from the pens of the combatants. At first, the fight was confined to the pages of technical and professional journals; later, it was carried into more popular publications, with the result that information about intelligence tests is now a matter of relatively common property.

Out of the smoke of battle, there has appeared a book[1] which brings together the arguments of one combatant. In this book Bagley defends the position "(1) that education, far from being merely an expression or concomitant of intelligence, plays a positive and indispensable rôle in the development of intelligence and (2) that, perhaps in a limited and yet in a very real sense, education *does* operate as an equalifying force among individuals of varying degrees of native endowment—in short, that education is (or can be made) in some measure a leveling-up process" (p. 5). Bagley defends his thesis by attacking the "fatalistic implications" of the evidence drawn from intelligence tests and by bringing forth data from various sources, including intelligence tests, to support his own point of view. He is frank in stating his bias and clearly admits "the grave danger of regarding as anything more than provisional the inference drawn from observed facts or apparent facts in a complicated field of study" (p. 156). Since, however, this limitation applies not only to his own work but to that of the opposition, the net result is to show clearly the need for an exhaustive study, if such is possible, of the whole problem of heredity versus environment. Certainly, the untrained reader should read the book with this reservation clearly in mind.

F. Dean McClusky

Purdue University

Professionalized subject matter of formal English.—A noteworthy contribution[2] to the subject of teaching English has recently grown out of the classroom experience of a scholarly and capable workman. Professor E. A. Cross, of the Colorado State Teachers College, believes that teachers of the mother tongue should know the origin and development of the language, should be grounded in its technical aspects, should comprehend it as the instrument of social communication, and should be acquainted with its educational values and teaching problems. Having this thesis in mind and rightly leaving the subjects of composition and of children's literature to other workmen or to later treatment by himself, Dr. Cross has confined his present materials to those phases of English that have to do with words and sentences—grammar in general.

[1] William C. Bagley, *Determinism in Education.* Baltimore: Warwick & York, Inc., 1925. Pp. 194.

[2] E. A. Cross, *Fundamentals in English.* New York: Macmillan Co., 1926. Pp. xiv+526.

The book is divided into two parts. Part One sets forth in sixteen chapters the development of the English language as a constituent part of the history of our race. Part Two, made up of fifteen chapters, deals with "The Teacher's Margin and the Pupil's Needs." To each chapter are appended a comprehensive bibliography and admirable suggestions for individual problems and research. This textbook, obviously intended for advanced classes in teachers' colleges, outlines a semester of work which should be a part of the training of every teacher of English.

R. L. LYMAN

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